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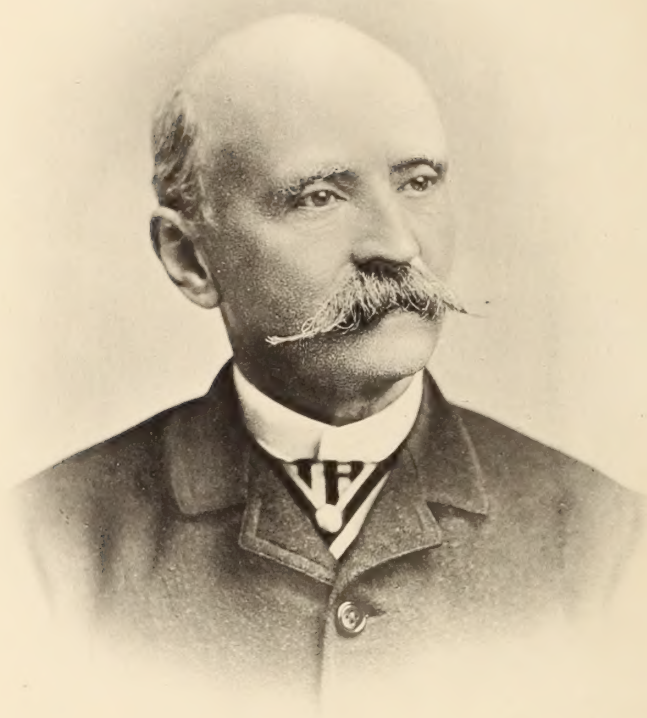
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PHILADEL

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PROCEEDINGS

OF THE

American Pharmaceutical Association

AT THE

THIRTY-FOURTH ANNUAL MEETING,

HELD AT PROVIDENCE, R. I., SEPTEMBER, 1886.

ALSO THE

CONSTITUTION, BY-LAWS, AND ROLL OF MEMBERS.



PHILADELPHIA :

PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.

1886.

OFFICERS OF THE ASSOCIATION.

1886-87

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S. J. BENDINER	New York, N. Y.
A. TSCHEPPE	New York, N. Y.

And the following gentlemen to represent State (or District) Pharmaceutical Associations:

<i>Alabama.</i>	P. C. Candidus, Mobile.	<i>Mississippi.</i>	S. P. Head, Terry.
<i>Arkansas.</i>	Jas. E. Gibson, Little Rock.	<i>Missouri.</i>	J. M. Good, St. Louis.
<i>California.</i>	Emlen Painter, New York.	<i>Nebraska.</i>	Norman A. Kuhn, Omaha.
<i>Connecticut.</i>	Charles A. Rapelye, Hartford.	<i>New Hampshire.</i>	M. S. Woodman, West Lebanon.
<i>Dist. Columbia.</i>	H. E. Kalusowski, Washington.	<i>New Jersey.</i>	Chas. B. Smith, Newark.
<i>Dakota.</i>	Henry L. Warne, Mitchell.	<i>New York.</i>	Luther F. Stevens, Brooklyn.
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<i>Illinois.</i>	C. S. Hallberg, Chicago.	<i>Ohio.</i>	L. C. Hopp, Cleveland.
<i>Indiana.</i>	Geo. W. Sloan, Indianapolis.	<i>Pennsylvania.</i>	Chas. T. George, Harrisburg.
<i>Iowa.</i>	T. W. Ruete, Dubuque.	<i>Rhode Island.</i>	E. A. Calder, Providence.
<i>Kansas.</i>	R. J. Brown, Leavenworth.	<i>South Carolina.</i>	G. J. Luhn, Charleston.
<i>Kentucky.</i>	C. L. Diehl, Louisville.	<i>Tennessee.</i>	J. S. Robinson, Memphis.
<i>Louisiana.</i>	Alex. K. Finlay, New Orleans.	<i>Texas.</i>	E. M. Wells, Fort Worth.
<i>Maryland.</i>	C. Caspari, Jr., Baltimore.	<i>Virginia.</i>	C. A. Santos, Norfolk.
<i>Massachusetts.</i>	Wm. W. Bartlet, Boston.	<i>West Virginia.</i>	C. Menkemeller, Wheeling.
<i>Michigan.</i>	A. B. Stevens, Ann Arbor.	<i>Wisconsin.</i>	F. B. Power, Madison.
<i>Minnesota.</i>	Wilmot S. Getty, St. Paul.	<i>Quebec.</i>	Wm. Ahern, Quebec.
		<i>Ontario.</i>	(Nomination deferred.)

COUNCIL.

MEMBERS OF THE COUNCIL.

Term expires.

1887.	THE OFFICERS OF THE ASSOCIATION, <i>ex officio</i> :	
"	WILLIAM J. M. GORDON	Cincinnati, O.
"	JOSEPH L. LEMBERGER	Lebanon, Pa.
"	WILLIAM S. THOMPSON	Washington, D. C.
1888.	WILLIAM H. ROGERS	Middletown, N. Y.
"	WILLIAM SAUNDERS	London, Ont.
"	ALBERT E. EBERT	Chicago, Ill.
1889.	PHILIP C. CANDIDUS	Mobile, Ala.
"	GEORGE W. KENNEDY	Pottsville, Pa.
"	ALBERT H. HOLLISTER	Madison, Wis.

OFFICERS OF THE COUNCIL.

WILLIAM S. THOMPSON, Chairman, HENRY J. MENNINGER, Vice-Chairman.
 GEORGE W. KENNEDY, Secretary.

COMMITTEES OF THE COUNCIL.

On Membership : GEORGE W. KENNEDY, Chairman,
 HENRY J. MENNINGER,
 WILLIAM H. ROGERS,
 PHILIP C. CANDIDUS,
 ALBERT E. EBERT,
 THE TREASURER AND PERMANENT SECRETARY OF THE
 ASSOCIATION, *ex-officio*.

On Finance : JOSEPH L. LEMBERGER, Chairman,
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 WILLIAM S. THOMPSON.

On Publication : HENRY J. MENNINGER, Chairman,
 C. LEWIS DIEHL,
 WILLIAM SAUNDERS,
 NORMAN A. KUHN,
 JOHN M. MAISCH.

On Centennial Fund : CHARLES A. TUFTS, Chairman,
 JOSEPH L. LEMBERGER,
 JOHN M. MAISCH.

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION. (DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852 .	Philadelphia, Pa. .	<i>Daniel R. Smith</i> , Philadelphia.	<i>George W. Andrews</i> , Baltimore.	Samuel M. Colcord, Boston.	<i>C. Augustus Smith</i> , Cincinnati.
Aug. 24, 1853 .	Boston, Mass . . .	William A Brewer, Boston.	George D. Coggeshall, New York.	<i>Alexander Ducal</i> , Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854 .	Cincinnati, O . . .	<i>William B. Chapman</i> , Cincinnati.	Henry T. Cummings, Portland, Me.	<i>John Meekim</i> , New York.	<i>Joseph Laidley</i> , Richmond, Va.
Sept. 11, 1855 .	New York, N. Y .	<i>John Meekim</i> , New York.	Charles B. Guthrie, Memphis, Tenn.	<i>Charles Ellis</i> , Philadelphia.	<i>Henry F. Fish</i> , Waterbury, Conn.
Sept. 9, 1856 .	Baltimore, Md . . .	<i>George W. Andrews</i> , Baltimore.	<i>John L. Kidwell</i> , Washington, D. C.	Frederick Stearns, Detroit, Mich.	<i>Henry T. Kiersted</i> , New York.
Sept. 8, 1857 .	Philadelphia, Pa. .	<i>Charles Ellis</i> , Philadelphia.	<i>James Cooke</i> , Fredericksburg, Va.	<i>Samuel P. Peck</i> , Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858 .	Washington, D. C .	<i>John L. Kidwell</i> , Georgetown, D. C.	Edward Squibb, Brooklyn, N. Y.	<i>James O' Gallagher</i> , St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859 .	Boston, Mass . . .	Samuel M. Colcord, Boston.	<i>William Procter, Jr.</i> , Philadelphia.	Joseph Roberts, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860 .	New York, N. Y. .	<i>Henry T. Kiersted</i> , New York.	William J. M. Gordon, Cincinnati.	William S. Thompson, Baltimore.	Theodore Metcalf, Boston.
Aug. 27, 1862 .	Philadelphia, Pa. .	<i>William Procter, Jr.</i> , Philadelphia.	<i>John Milhan</i> , New York.	<i>Eugene L. Massel</i> , St. Louis.	J. Faris Moore, Baltimore.
Sept. 8, 1863 .	Baltimore, Md. . .	J. Faris Moore, Baltimore.	John M. Maisch, Philadelphia.	Charles A. Tufts, Dover, N. H.	<i>George W. Weyman</i> , Pittsburgh.
Sept. 21, 1864 .	Cincinnati, O . . .	William J. M. Gordon, Cincinnati.	<i>Richard H. Stabler</i> , Alexandria, Va.	Enno Sander, St. Louis.	<i>Thomas Hollis</i> , Boston.

LIST OF OFFICERS. (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865.	Boston, Mass. . . .	Henry W. Lincoln, Boston.	George C. Close, Brooklyn, N. Y.	<i>Elijah W. Suckinder</i> , Cleveland, O.	Charles A. Heinitsh, Lancaster, Pa.
Aug. 22, 1866.	Detroit, Mich. . . .	Frederick Stearns, Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	Ezekiel H. Sargent, Chicago.	<i>John W. Shadden</i> , New York.
Sept. 10, 1867.	New York	<i>John Milhau</i> , New York.	Robert J. Brown, Leavenworth, Kan.	N. Hynson Jennings, Baltimore.	<i>David Henchman</i> , Boston.
Sept. 8, 1868.	Philadelphia, Pa. . .	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Bringlehurst</i> , Wilmington, Del.	<i>Edward S. Hayne</i> , Cincinnati.	Albert E. Ebert, Chicago.
Sept. 7, 1869.	Chicago, Ill. . . .	Ezekiel H. Sargent, Chicago.	Ferdinand W. Sennewald, St. Louis.	John H. Pope, New Orleans.	Joel S. Orne, Cambridgeport, Mass.
Sept. 13, 1870.	Baltimore, Md. . . .	<i>Richard H. Stabler</i> , Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	<i>Eugene L. Massol</i> , St. Louis.
Sept. 12, 1871.	St. Louis, Mo. . . .	Enno Sander, St. Louis.	C. Lewis Dicl, Louisville, Ky.	George F. H. Markoe, Boston.	Matthew F. Ash, Jackson, Miss.
Sept. 3, 1872.	Cleveland, O. . . .	Albert E. Ebert, Chicago.	Samuel S. Garrigues, East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	Henry C. Gaylord, Cleveland, O.
Sept. 16, 1873.	Richmond, Va. . . .	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	Paul Balluff, New York.
Sept. 8, 1874.	Louisville, Ky. . . .	C. Lewis Diehl, Louisville, Ky.	Joseph Roberts, Baltimore.	William T. Wenzell, San Francisco.	Augustus R. Bayley, Cambridgeport, Mass.
Sept. 7, 1875.	Boston, Mass. . . .	George F. H. Markoe, Boston.	Frederick Hoffmann, New York.	T. Roberts Baker, Richmond, Va.	Christian F. G. Meyer, St. Louis.
Sept. 12, 1876.	Philadelphia, Pa. . .	Charles Bullock, Philadelphia.	Samuel A. D. Sheppard, Boston.	Gustavus J. Luhn, Charleston, S. C.	Jacob D. Wells, Cincinnati.
Sept. 4, 1877.	Toronto, Can. . . .	William Saunders, London, Ont.	Ewen McIntyre, New York.	John Ingalls, Macon, Ga.	Emlen Painter, San Francisco.

Nov. 26, 1878.	Atlanta, Ga. . . .	Gustavus J. Luhn, Charleston, S. C.	Frederick T. Whiting, Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	William H. Crawford, St. Louis.
Sept. 9, 1879.	Indianapolis, Ind.	George W. Sloan, Indianapolis, Ind.	T. Roberts Baker, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880.	Saratoga, N. Y. . .	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	William S. Thompson, Washington.	William Simpson, Raleigh, N. C.
Aug. 23, 1881.	Kansas City, Mo. .	P. Wendover Bedford, New York.	Emlen Painter, San Francisco.	George Leis, Lawrence, Kan.	John F. Judge, Cincinnati.
Sept. 12, 1882.	Niagara Falls, N. Y.	Charles A. Heinitsh, Lancaster, Pa.	John Ingalls, Macon, Ga.	Louis Dohme, Baltimore.	William B. Blanding, Providence, R. I.
Sept. 11, 1883.	Washington, D. C.	William S. Thompson, Washington, D. C.	Charles Rice, New York.	Frederick H. Masi, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884.	Milwaukee, Wis. .	John Ingalls, Macon, Ga.	John A. Dadd, Milwaukee, Wis.	Henry Canning, Boston, Mass.	Charles F. Goodman, Omaha, Neb.
Sept. 8, 1885.	Pittsburgh, Pa. . .	Joseph Roberts, Baltimore, Md.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886.	Providence, R. I. .	Chas. A. Tufts, Dover, N. H.	Henry J. Menninger, Brooklyn, N. Y.	M. W. Alexander, St. Louis, Mo.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887.	Cincinnati, O. . .				

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852-54.
 Samuel M. Colcord, Boston, 1854-56, and 1857-59.
James S. Aspinwall, New York, 1856-57.

Isabel Boyden, Boston, 1859-60.
 Henry Haviland, New York, 1860-63.
 J. Brown Baxley, Baltimore, 1863-65.

Charles A. Tufts, Dover, N. H., 1865-86.
 Samuel A. D. Sheppard, Boston, 1886-87.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852-53.
Edward Parrish, Philadelphia, 1853-54.
Edward S. Wayne, Cincinnati, 1854-55.
 William J. M. Gordon, Cincinnati, 1855-59.

Charles Bullock, Philadelphia, 1859-60.
 James T. Shinn, Philadelphia, 1860-62.
 Peter W. Bedford, New York, 1862-63.
 William Evans, Jr., Philadelphia, 1863-64.

Henry N. Kittenhouse, Philadelphia, 1864-65.
 John M. Maisch, Philadelphia, 1865-87.

CORRESPONDING SECRETARIES.

William Procter, Jr., Philadelphia, 1852-53,
 and 1854-57.
William B. Chapman, Cincinnati, 1853-54.

Edward Parrish, Philadelphia, 1857-58.
Ambrrose Smith, Philadelphia, 1858-59.
William Hageman, New York, 1859-60.

Peter W. Bedford, New York, 1860-62, and 63-66.
 John M. Maisch, Philadelphia, 1862-63.

LOCAL SECRETARIES.

For the meeting
held in

1867 . . . P. Wendover Bedford.
 1868 . . . Alfred B. Taylor.
 1869 . . . Henry W. Fuller.
 1870 . . . J. Faris Moore.
 1871 . . . *William H. Crawford*.
 1872 . . . Henry C. Gaylord.
 1873 . . . Thomas H. Havard.

For the meeting
held in

1881 . . . William T. Ford.
 1882 . . . Hiram E. Griffith.
 1883 . . . Charles Becker.
 1884 . . . Henry C. Schranck.
 1885 . . . George A. Kelly.
 1886 . . . William B. Blanding.
 1887 . . . George W. Voss.

REPORTER ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-87.

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President, in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

<i>Alabama,</i>	P. C. Candidus, cor. Dauphin and Cedar streets,	Mobile.
<i>Arkansas,</i>	Geo. W. Cabell, Congress and Bull streets,	Hot Springs.
<i>California,</i>	William T. Wenzell, 852 Market street,	San Francisco.
<i>Colorado,</i>	Hugo R. Hartung, 230 Fifteenth street,	Denver.
<i>Dist. of Columbia,</i>	John A. Milburn, 1429 Pennsylvania avenue,	Washington.
<i>Connecticut,</i>	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
	Luzerne I. Munson, Apothecaries' Hall,	Waterbury.
<i>Delaware,</i>	Linton Smith, cor. Seventh and Market streets,	Wilmington.
<i>Georgia,</i>	Theo. Schumann, Whitehall and Hunter streets,	Atlanta.
	Robert H. Land, 270 Broad street,	Augusta.
	John Ingalls, cor. Fourth and Poplar streets,	Macon.
<i>Illinois,</i>	E. H. Sargent, 125 State street,	Chicago.
	David G. Plummer, 6 Main street,	Bradford.
	Charles B. Allaire, 108 Main street,	Peoria.
<i>Indiana,</i>	Albert B. Buck,	Anderson.
	Henry J. Schlæpfer, Second and Main streets,	Evansville.
	George W. Sloan, 304 North Meridian street,	Indianapolis.
	David Hilt, 84 Main street,	Lafayette.
	William C. Buntin, 600 Main street,	Terre Haute.

<i>Iowa,</i>	John W. Ballard, 106 West Second street,	Davenport.
	Theodore W. Ruete, 379 Main street,	Dubuque.
	Robert W. Crawford, 9 Market street,	Fort Dodge.
	George H. Schafer, 129 Front street,	Fort Madison.
	Silas H. Moore, 80 Fourth street,	Sioux City.
<i>Kansas,</i>	George Leis, 90 Massachusetts street,	Lawrence.
<i>Kentucky,</i>	Robert J. Brown, 113 Delaware street,	Leavenworth.
	C. Lewis Diehl, cor. Third and Broadway,	Louisville.
	William H. Averill, 435 Main street,	Frankfort.
<i>Louisiana,</i>	Isaac L. Lyons, 42 Camp street,	New Orleans.
	Joseph T. Thibodeaux, Main street,	Thibodeaux.
<i>Maine,</i>	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edmund Dana, Jr., 373 Congress street,	Portland.
<i>Maryland,</i>	Henry A. Elliott, 286 Lexington street,	Baltimore.
	Thomas W. Shryer, 103 Baltimore street,	Cumberland.
<i>Massachusetts,</i>	George M. Hoyt, 257 Columbus avenue,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, 51 Vine street,	Charlestown.
	Frederick T. Whiting, Main street,	Great Barrington.
	Freeman H. Butler, 141 Central street,	Lowell.
	Joseph W. Colcord, 153 Union street,	Lynn.
	Samuel O. Daniels, Main and Summer streets,	Natick.
	James E. Blake, 65 North Second street,	New Bedford.
	Joseph J. Estes, Union and Church streets,	Rockland.
	Thomas B. Nichols, 159 Essex street,	Salem.
	Joseph T. Webber, State and Main streets,	Springfield.
	William Bush, 56 Front street,	Worcester.
<i>Michigan,</i>	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	Theodore Ronnefeld, 195 Gratiot street,	Detroit.
	Henry Melchers, Genesee and Jefferson street,	East Saginaw.
<i>Minnesota,</i>	Karl Simmon, Third and Market streets,	St. Paul.
<i>Mississippi,</i>	Joseph W. Eckford, Commerce street,	Aberdeen.
	Matthew F. Ash,	Jackson.
<i>Missouri,</i>	James F. Hurt, Broadway,	Columbia.
	William T. Ford, 1305 Cherry street,	Kansas City.
	James M. Good, 2348 Olive street,	St. Louis.
<i>Nebraska,</i>	Charles F. Goodman, 180 Farnham street,	Omaha.
<i>Nevada,</i>	William A. Perkins, 213 Main street,	Virginia City.
<i>New Hampshire,</i>	Bayard T. Perry, 1088 Elm street,	Manchester.
	E. S. Russell, 69 Main street,	Nashua.
	Joseph H. Thatcher, 12 Market street,	Portsmouth.
<i>New Jersey,</i>	Albert P. Brown, cor. Fifth and Federal streets,	Camden.
	Jonathan B. Drake, 132 Broad street,	Elizabeth.
	Hermann Klussmann, Fourth street and La-	
	fayette avenue,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 831 Broad street,	Newark.
	Robert E. Parsons, 19 Main street,	Orange.
	Howard P. Reynolds, Front and Cherry streets,	Plainfield.
	Randal Riskey, 157 North Green street,	Trenton.

<i>New York,</i>	Charles H. Gaus, 202 Washington avenue,	Albany.
	G. C. Close, 67 Cumberland street,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. DuBois, 281 Main street,	Catskill.
	James T. King, cor. Main and South streets,	Middletown.
	Daniel C. Robbins, 91 Fulton street,	New York.
	G. H. Haass, 38 Main street,	Rochester.
	John G. Bissell, 45 Dominick street,	Rome.
	Charles F. Fish, 114 Broadway,	Saratoga.
	Willis T. Hanson, 195 State street,	Schenectady.
	Charles W. Snow, 28 East Genesee street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
<i>North Carolina,</i>	William Simpson, 33 Fayetteville street,	Raleigh.
	John H. Harding, 124 South Front street,	Wilmington.
<i>Ohio,</i>	Andrew M. Armstrong, 106 East Market street,	Akron.
	Walter H. Howson, Water street,	Chillicothe.
	J. U. Lloyd, Court and Plum streets,	Cincinnati.
	George L. Heckler, 1099 Broadway street,	Cleveland.
	Charles Huston, 43 South High street,	Columbus.
	Thomas J. Casper, 41 East Main street,	Springfield.
	Charles Hohley, 248 South street,	Toledo.
	Edgar M. Hatton, Fifth and Main streets,	Zanesville.
<i>Pennsylvania,</i>	Jacob A. Miller, cor. Second and Chestnut streets,	Harrisburg.
	Charles A. Heinitsh, 16 East King street,	Lancaster.
	Joseph L. Lemberger, 8 North Ninth street,	Lebanon.
	Francis W. Walker, Jr.,	New Brighton.
	Rich. M. Shoemaker, cor. Fourth and Race streets,	Philadelphia.
	James B. Cherry, 23 Fourth avenue,	Pittsburgh.
	Philip M. Ziegler, 526 Penn street,	Reading.
	Edward A. Cornell, Tenth and Pine streets,	Williamsport.
<i>Rhode Island,</i>	James H. Taylor, 104 Thomas street,	Newport.
	Wm. K. Reynolds, 254 Friendship street,	Providence.
<i>South Carolina,</i>	Gustavus J. Luhn, Post-office Box No. 582,	Charleston.
<i>Tennessee,</i>	Jas. S. Robinson, cor. Third and Madison streets,	Memphis.
	John C. Wharton, 38 Union street,	Nashville.
<i>Texas,</i>	Thomas W. Powell, 10 Houston street,	Fort Worth.
<i>Virginia,</i>	Frederick H. Masi, cor. Main and Granby,	Norfolk.
	T. Roberts Baker, 919 East Main street,	Richmond.
<i>West Virginia,</i>	Edwin L. Boggs, Kanawha Bank Building,	Charleston.
	Edmund Bocking, 1 Odd Fellows' Hall,	Wheeling.
<i>Wisconsin,</i>	John R. Drake, 365 South Water street,	Milwaukee.
<i>Prov. Nova Scotia,</i>	Francis C. Simson,	Halifax.
<i>Prov. Ontario,</i>	John Lowden, 18 DeBreselles street,	Toronto.
<i>Prov. Quebec,</i>	Henry R. Gray, 144 St. Lawrence Main street,	Montreal.

LIST OF QUERIES.

THIRTY-FIFTH ANNUAL MEETING, TO BE HELD IN CINCINNATI, OHIO,
SEPTEMBER, 1887.

We offer the following list of Queries, in expectation that the members may find a suitable subject for investigation or inquiry for our next annual meeting.

We do not offer any large number of subjects, but desire the individual members to select subjects suitable to their own tastes, working in their own line or favorite department. Questions and difficulties are constantly presenting themselves before us in our daily work, forming valuable and practical subjects for investigation.

The Committee earnestly solicits your aid in the work before us, of advancing the objects and interest of our American Association. Write us a paper on a subject of YOUR OWN SELECTION, tabulating results of your own observations.

We call attention to the CENTENNIAL FUND, the interest of which is to be used for defraying the expenses of suitable investigations (see Chap. VII of By-Laws of the Council). Should you desire to avail yourself of this fund, please make application to the Permanent Secretary, Prof. J. M. Maisch, Philadelphia, Pa.

To encourage investigations, the "EBERT PRIZE" is offered "for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products; provided, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the fund" (see Proceedings 1873, page 58).

Papers when completed should be forwarded at once to the chairman of Committee on Papers and Queries. In connection with this we desire to call your attention to the following resolution, adopted at the Boston meeting of 1875 (see Proceedings 1875, p. 795):

"*Resolved*, When authors of scientific papers have prepared copies or abstracts of their essays previous to the meeting of the Association, they shall be at liberty to distribute such copies or abstracts at any time *subsequent* to the official reading of their respective papers; *provided*, that the papers are always headed in publication by the statement that they have been read at our meeting."

We request of writers to append a synopsis of the contents of their papers. (See By-Laws, Chap. VII., Art. IV.)

1. Examine the Oils of Peppermint (commercial), and report as to their comparative value.

2. Prepare extracts of Vanilla from Vanillin, and compare them to similar preparations from the natural drug.

3. A ready and accurate method for the assay of alkaloidal tinctures is desired.

4. Is our Powdered Cantharides adulterated? If so, what is the nature of the adulterant and means of detecting it?

5. Is the American cultivated *Digitalis* equal therapeutically to that supplied by foreign markets?
6. Purity of our present supply of Lanolin; give ready tests for ascertaining purity.
7. Is Cod Liver Oil more thoroughly emulsionized by Pancreatin than by any other agent?
8. To what extent can Corrosive Sublimate be safely used as an antiseptic?
9. To what extent is the presence of Hygrine in Cocaine detrimental in the use of the latter?
10. Is the present process for separating Quinine from the total alkaloids in the official process for the assay of Cinchona Bark satisfactory? If not, suggest a better one.
11. What is the best and most permanent menstruum for Fluid Extract of Licorice Root?
12. Is the standardization of pharmaceutical preparations of Ergot practicable?
13. An economical and practical process for making pure Quinine from the Sulphate is desired.
14. What is the best means of clarifying Liquid Gutta Percha? A better one than the present official process is desired.
15. What percentages of alkaloids do the present tinctures of Belladonna and Hyoscyamus respectively contain?
16. Is the present official formula for making Soap Liniment satisfactory?
17. Commercial strained Honey is largely adulterated; tabulate a number of ready tests for the detection of these adulterations.
18. Is the present official Syrup of Tolu a satisfactory preparation from a pharmaceutical point of view?
19. To what extent is the substitution of Petrolatum for lard in our officinal ointments advisable, as Ung. Iodi, Ung. Hydrargyri Nitratis, etc.?
20. Is our market supply of Sulphate of Morphine free from any foreign impurities?

V. COBLENTZ (*Chairman*), Springfield, Ohio,

W. W. BARTLET, Boston, Mass.,

EMLEN PAINTER, New York, N. Y.,

Committee.

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PREFATORY NOTICE.

THE resolution passed by the Association at the fourth session of the last meeting (see page 170) directing the publication of the Proceedings on or before January first, rendered it necessary to make such arrangements as would permit the work of the Printer to proceed without interruption, during the ten or eleven weeks in which time the printing must be completed. For this reason it was found necessary in the present volume to alter the sequence of the material in the manner in which it is now presented. Portions of the manuscript reached the Secretary October 6, 7, 9, 21, and December 13.

The late Professor Edward S. Wayne, whose portrait is issued with this volume, took a deep interest in this Association, and during its early history was very active in the promotion of its objects. At the meeting held in 1855, he presented an "Essay on the Growth and Production of Wines in the West, and on Catawba Brandy and Tartar," which—aside from the various addresses and reports of Committees—was the first paper read before this Association: and in the following year, 1856, he contributed no less than seven papers of scientific and practical interest. A biographical sketch of the deceased will be found on page 141 of this volume.

The prices of the several issues of the Proceedings now on hand, *including postage*, are:

	Unbound.	Bound.
1851, 1852, 1853, 1854, 1855, each	\$0 25	
1857, ...	50	\$0 75
1858, ...	1 50	1 75
1859, ...		1 75
1860, ...		1 25
1862, 1863, each		1 50
1864, 1865, 1866, each	1 50	1 80
1867, ...	2 20	2 50
1868, 1869, 1870, each	2 50	3 00
1871, ...	4 50	5 25
1872, ...	2 50	3 00
1873, 1874, each	5 00	5 50
1875, 1876, each	7 00	7 50
1877, ...	6 00	6 50
1878, 1879, each	7 00	7 50
1880, ...	6 00	6 50
1881, ...	5 50	6 00
1882, ...	6 00	6 50
1883, ...	5 00	5 50
1884, 1885, 1886, each	5 50	6 00

1856 out of print; none published in 1861.

The Publishing Committee offer the Proceedings from 1851 to the present time in sets of five or more volumes, at the following prices, *exclusive of postage or express charges*:

For any 5 volumes a discount of 20 per cent. on the above prices.

"	10	"	"	30	"	"	"
"	20	"	"	40	"	"	"
For the whole set		"		50	"	"	"

All orders for Proceedings should be addressed to the Permanent Secretary, John M. Maisch, 143 North Tenth street, Philadelphia, Pa.

The price of the nickel badge has been reduced by vote of the Council to 25 cents, on receipt of which sum by the Permanent Secretary the badge will be sent by mail.

The Thirty-fifth Annual Meeting will be held in Cincinnati, O., on the first Monday (5th day) of September, 1887, at 2 o'clock, p. m. Blank applications for membership may be obtained from the Authorized Agents or from the Permanent Secretary. Applications properly filled should reach the chairman of the Committee on Membership, George W. Kennedy, Pottsville, Pa., on or before August 27; if sent later they should be addressed to the care of the Local Secretary, George W. Voss, Cincinnati, O. The fees should be sent by postal money order, by draft, or by bank-check.

REPORTS OF STANDING COMMITTEES.

REPORT OF THE COMMITTEE ON THE DRUG MARKET.

To the Members of the American Pharmaceutical Association :

I was not informed until a very late date that it would again be expected that I should write this report, owing to the absence from the country of the Chairman of our Committee. As I had then so many other matters to engross my attention, it was impossible for me to obtain as full data as I wished.

As information which would naturally be expected in this report is now so fully and frequently brought to the notice of our members by the numerous Trade Journals, it is extremely doubtful whether the work of this Committee is longer of any great practical value. I believe, however, that the prices of the principal drugs tabulated for our Proceedings may possess an historical interest, and for this reason I have devoted my attention principally to this feature.

I have also embodied in the report a list of imports of the principal articles at the port of New York for the fiscal year 1885-1886.

The notable features of the year have been the continued downward course of Quinine until it has reached the present remarkably low figure, and the low prices of Opium and Morphine. Quinine is quoted at the writing of this report at 60 cts. per oz., in cans, for the leading American brand, while some foreign and at least one domestic make is quoted at 50 cts. per ounce in large cans, say 100-ounce cans.

Attention should be directed to the growing tendency of retail dealers to order their supplies in such small quantities as to very materially enhance their cost. The facilities offered by transportation companies for prompt deliveries has led the retailer into this habit, and he is prone to overlook the fact that jobbers are obliged to reimburse themselves for the increased cost of putting up goods in such small parcels. Druggists should purchase at least a month's supply, and in case of staples, even larger quantities to secure advantageous rates.

Aside from the labor disturbances, which seriously threatened the prosperity of the country early in the year, the period under review had been a fairly active one, and although values remained low the wheels of in-

dustry were kept in motion without much interruption. The causes referred to in our former report as specially affecting profits in the Drug Trade, are still unabated if not actually aggravated. Reference was then made to the rapid increase in the sale of ready packeted articles and attention called to the fact that physicians were largely responsible for this state of affairs. It was not denied that while many of the articles then particularly referred to were prepared from secret formulæ, they possessed positive merits, and were used by Physicians because they were found valuable in their practice. During the current year, however, by a system of extensive and persistent advertising, a demand has been created for an article that is doing incalculable injury to the fair fame of the profession of Pharmacy. I refer to what the enterprising bottlers are pleased to call malt whiskey. Hitherto Pharmacists have always very properly taken the ground that the United States revenue liquor tax was unjustly levied upon most of their number, because they did not handle liquors excepting as required strictly for medicinal purposes. It is a matter of the profoundest regret and a cause of humiliation that this argument has been greatly weakened by the fact that certain concerns engaged in the wholesale liquor business conceived the idea that a favorable opportunity offered to increase sales of what may or may not be articles of merit, by forcing them through the respectable channels offered by the drug trade. Physicians' certificates by the column were published, whether true or false, and the movement has swept the country. I have heard it stated by many conscientious druggists that they for a long time absolutely refused to yield to this demand until driven to it by physicians prescribing the article. It would be well for this respectable body to take special cognizance of this latest outrage upon the dignity of the profession, and devise by the next annual meeting some means to conquer or at least render harmless this medicinal (?) enemy. We have watched this tide swelled by printers' ink, sweeping the country and threatening to engulf the fame of the profession, and asked what outrage may we look for next? The question is, must it go on, or will you dump this class of merchandise into the grog-shops, where it belongs?

Your reporter takes pleasure in acknowledging his indebtedness for valuable information furnished by Mr. Alexander H. Jones, with Powers & Weightman, the Oil, Paint and Drug Reporter, Messrs. Chas. Pfizer & Co., and Messrs. Dodge & Olcott.

Respectfully submitted,

M. N. KLINE, *Chairman.*

Imports, Fiscal Year 1885 to 1886. New York.

Acid, Boric	623,975 Pounds.
“ Carbolic	195,599 “
“ Citric	138,660 “
Ammonia Carb.	616,473 “
Argols	9,164,806 “

Asafoetida	254,048 Pounds.
Bark, Cinchona	1,636,309 "
" Peruvian	260,876 "
Borax, Refined	1,120 "
Canary Seed	10,493,979 ,
Cantharides	15,565 "
Camphor, Crude	861,637 "
Cubebs	106,318 "
Ergot	81,339 "
Glycerin	9,354,498 "
Gum Arabic	840,911 "
Hempseed	2,550,358 "
Insect Flowers	240,170 "
" Powder	302,817 "
Licorice, Paste	1,291,965 "
" Root	48,071,888 "
Magnesia Carb.	67,000 "
Morphia	15,987 Ounces.
Oil, Castor	11,209 Gallons.
" Cod Liver	88,635 "
Opium	293,652 Pounds.
Quinine	1,122,100 Ounces.
Soap, Castile	2,800,133 Pounds.

TABULATED REPORT OF PACKAGE PRICES.

1885.

1886.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.
Acid, Benzoic, English			12 ¹ / ₂	12 ¹ / ₂	12 ¹ / ₂	12 ¹ / ₂	12 ¹ / ₂	13	13	13	13	13
" Citric	51	50	50	50	50	54	64	70	60	66	60	66
" Oxalic.	8	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	7	6 ³ / ₄	6 ³ / ₄	6 ³ / ₄
" Salicylic.	\$1 75	\$1 75	\$1 70	\$1 70	\$1 70	\$1 70	\$1 70	\$1 65	\$1 65	\$1 65	\$1 65	\$1 65
" Tartaric, Powdered	46	40	46	46	46	46	46	46	46	40	46	46
Alcohol, highest	2 07	2 07	2 03	2 07	2 07	2 08	2 09	2 08	2 08	2 06	2 06	2 05
" lowest	2 07	2 03	2 01	2 04	2 07	2 07	2 08	2 08	2 07	2 06	2 06	2 01
Ammon. Carb	10 ¹ / ₂	11	10 ³ / ₄	10 ¹ / ₂	10 ¹ / ₂	10 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₄	9 ¹ / ₄	9 ¹ / ₄
Bal. Copaiba	31	32	31	31	33	34	34	34	33	32	31	32
" Peru	1 60	1 55	1 50	1 45	1 40	1 25	1 40	1 40	1 30	1 25	1 20	1 10
" Tolu	34	36	35	35	34	33	32 ¹ / ₂	32	32	30	31	31
Borax	7 ⁷ / ₈	7 ³ / ₄	7 ¹ / ₂	7 ⁷ / ₈	7 ⁷ / ₈	7 ⁵ / ₈	7 ¹ / ₂	7 ¹ / ₂	7	6 ⁷ / ₈	6 ³ / ₄	6 ⁵ / ₈
Camphor	22 ¹ / ₂	22	22	22	22	23	23	23	22 ³ / ₄	22 ³ / ₄	22 ³ / ₄	22 ¹ / ₂
Cantharides, Russ.	1 50	1 65	2 00	1 90	2 00	2 00	2 00	2 00	1 85	1 80	1 85	1 85
" Chinese	1 15	1 40	1 65	1 55	1 40	1 35	1 35	1 25	1 30	1 20	1 15	1 10
Cinchonidia Sulph., ozs., P. & W.	25	21	21	21	21	19	19	19	19	16	16	16
Chloroform	69	68	57	57	57	50	45	40	40	40	35	35
Cream Tartar, powd., 99%.	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂	35 ¹ / ₂
Cubeb Berries	70	75	75	75	87 ¹ / ₂	85	75	85	95	1 20	95	95
Figot, Spanish.	22	22	20	45	45	50	50	50	40	45	40	40
Flowers Arnica			7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	9	10	11	10	0 ¹ / ₂	9	8 ¹ / ₂
" Cham., Ger.	23	23	22	22	22	22	23	25	28	25	new 35	30
" Rom.	11 ¹ / ₂	11 ¹ / ₂	new 20	20	20	19	18	18	18	17	16	15
Glycerin, 500 lb. lots	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂	14 ¹ / ₂
Guarana	1 75	2 00	2 10	2 25	2 25	2 25	2 25	1 50	1 50	1 35	1 35	1 37 ¹ / ₂
Gum Arabic, 1st	51	49	48	59	75	75	72 ¹ / ₂	70	69	73	82 ¹ / ₂	82
" Asafoetida	14	14	13	13	13	13	12	11 ¹ / ₂	11 ¹ / ₂	11 ¹ / ₂	10 ¹ / ₂	10 ¹ / ₂
" Opium	3 40	3 40	3 40	3 40	3 50	3 35	3 20	3 15	3 10	3 00	2 95	2 90
" Shellac.	20	10 ¹ / ₂	19	21	21	20	19 ¹ / ₂	18 ¹ / ₂	18	17	16 ¹ / ₂	17 ¹ / ₂

TABULATED REPORT OF PACKAGE PRICES. — *Continued.*

1885.

1886.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.
Iodine Resub.	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50	\$3 50
Insect Powder.	28	28	28	28	28	28	28	28	28	28	28	28
Morph. Sulph. P. & W. 18	3 20	3 00	3 00	3 00	3 10	3 10	2 90	2 75	2 50	2 40	2 40	2 40
Oil Bergamot.	1 60	1 90	2 00	2 00	1 80	1 85	2 20	3 25	2 90	2 75	2 75	2 75
" Castor, cans.	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2
" Cod Liver, N. F. gal.	85	85	90	80	80	80	80	75	70	70	70	70
" " Norweg. blbl.	30 00	32 00	32 00	32 00	30 00	30 00	30 00	29 00	28 00	26 00	27 00	27 00
" Lemon.	1 20	1 60	1 75	1 65	1 65	1 75	2 25	3 25	2 60	2 50	2 62 1/2	2 62 1/2
" Olive, Malaga.	78	82 1/2	80	80	82	78	77	70	75	75	75	75
" Peppermint.	3 85	3 00	3 40	3 60	3 85	4 00	4 25	4 00	3 60	3 50	3 30	3 20
" Wintergreen.	1 85	2 00	2 00	2 00	2 05	2 05	1 95	1 85	1 75	1 75	1 75	1 75
Pot. Bromide.	34	34	34	34	36	36	35	35	34	34	34	34
" Iodide.	2 75	2 75	2 75	2 75	2 75	2 75	2 65	2 65	2 65	2 65	2 65	2 65
Quinine, Sulph., highest, P. & W., ozs.	75	75	95	85	85	80	80	80	80	75	67	65
Quinine, Sulph., lowest, P. & W., ozs.	75	75	85	85	80	80	80	80	80	70	67	65
Root, Gentian.	2 25	2 10	2 10	2 10	2 10	2 15	2 15	2 25	2 25	2 25	2 20	2 20
" Ginseng.	90	90	87 1/2	85	85	85	87 1/2	90	85	87 1/2	87 1/2	87 1/2
" Ipecac.	13	13	13	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12	12	12	12
" Jalap.	47 1/2	46	46	45	45	45	46	45	44	44	45	43
" Senega.	31	30	30	30	50	50	75	65	65	60	60	60
" Pink.	37 1/2	45	40	40	40	50	50	45	45	45	40	40
" Serpentina.	3 38	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
Seed, Canary, Sicily.	1 30	1 30	1 25	1 20	1 20	1 20	1 20	1 05	1 05	1 00	1 00	1 00
" Cardamom.	3 18	3 18	3 18	3	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 38	2 38	2 38
" Hemp.	4 1/4	4 1/4	4	4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4	3 3/4
" Rape.	6 1/4	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6	6
Soap, Castile, Mottled.	11	11	10 7/8	10 7/8	10 7/8	10 7/8	11	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4
Soap, Castile, Conti.	11	11	10 7/8	10 7/8	10 7/8	10 7/8	11	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4

Alcohol has remained about same as last year, the fluctuations being confined to a range of about eight cents per gallon.

Ammonia Carb., which was noted a year ago as very low in price at 11 to 11½ cents, has still further receded, closing at about 9¼ to 9½ cents per pound in casks for English, while American is held at 9¾ cents. A new American manufacturer is credited with being the cause of this further decline, although at the close of our report this maker holds his product at the higher figure, while agents for the English again quote at the lower. The foreign makers have pushed sales of their product very actively, as our table of imports shows, and one prominent domestic manufacturer has withdrawn entirely for the present.

Bismuth remains firm at the advanced figure which the combination fixed last year. *Sub-nitrate* has ruled at \$2.00 per pound in fifty-pound lots, during the period covered by our report.

Borax.—The competition of the past year has been between the California and Nevada producers, the duty on borax and boracic acid being prohibitory. The transcontinental freight war has also assisted to lower prices. The decline of the year has been from 8½ cents to 6⅝ cents. Although the article has found an outlet in new channels, still the output of California and Nevada is in excess of consumption, and prices will doubtless rule low until it is curtailed or some agreement is arrived at by the producers.

Camphor.—Refined has varied but little during the period under review, ranging from 22 cents to 23 cents per pound. The consumptive demand has been fully up to former years. Retailers in the large cities still make this article a *leader* in the spring months, and placards offering "camphor at 23 cents per pound" can everywhere be seen displayed in drug store windows, although it is well known that this represents less than cost.

Cantharides open at \$1.50 for Russian, to \$2.00 in December, and remain at near that figure to the close. The Chinese variety is now mostly sold by dealers.

Chloroform deserves mention on account of the great reduction in price which was brought about by the discovery of a patent process for its production, by which the alcohol used is not isolated as a commercial product, and consequently escapes the revenue tax.

Cinchonidine Sulph. has again steadily declined during the year, and the leading American brand is now quoted at about half the price named at the close of our former report. Our table gives price of P. & W. in ounce bottles. Foreign brands in large bulk are offering as low as 7 cents per ounce.

Cream Tartar has not changed during the year, the manufacturers of the article working in entire harmony. The demand is now confined to

what is known as 99 per cent., and actual tests show that the article is fully up to the high standard claimed for it. Druggists now rarely inquire for the mixed article sold as "grocers" or "commercial Cream Tartar."

Cubeb Berries have as usual been reported as "almost extinct," "but few bags to be had," etc., but the \$2 per pound figure predicted so frequently has not yet been realized, because some generous holder of "a few bags" would always come to the relief of the suffering "at a sacrifice."

Ergot, which showed an unusually low range of value at the close of our last report, advanced to 45 to 50 cts. in November, and has receded but little from that figure. Our quotation is for best Spanish.

Guarana, opening at \$1.75, advanced to \$2.25 in November. Large lots coming in rapidly, the value declined to \$1.35, but the last of the crop having arrived in this market, heavy sales took place, and quotations were advanced to present price of \$1.50 per lb. in lots.

Gum Arabic has still further advanced, and is now held in case lots at 82 cts. for first picked, and even more extreme figures are predicted.

Asafetida has not only ruled at very low figures, but the quality of the gum sent here recently has been unusually handsome. Under the stimulus of low prices imports have increased during the past year.

Iodine and Iodide of Potassium remain about as last year, the combination holding together successfully.

Morphine Sulphate has suffered a very material decline during this year, P. & W. opening at \$3.20 in $\frac{1}{8}$ oz. and closing at \$2.40 in July. Since this table was completed the price has been further marked down to \$2.25. It will be noticed that while opium has declined about 50 cts. per pound only, morphine has been marked down about \$1 per ounce. This undoubtedly is due to the aggressive steps taken by a comparatively new American manufacturer, who in order to gain a foothold, quoted from 25 to 50 cts. per ounce below P. & W. The latter firm have gradually marked their brand down to about the price named for other makes, and seem determined to hold their market.

Oil, Cod Liver, has gradually settled in value during the year, opening at \$30 per bbl. for Norwegian and closing at \$27. The production of Lofoden oil for 1886 is estimated to be about 14,200 bbls. of 25 imperial gallons, and the quality is very fine. The Finmark fishery, which is obtained later than the Lofoden, has not been as good, the yield this year, being only about 1,860 bbls.

Oils, Bergamot, Lemon, Orange. The fear expressed in our last report that the continued depression in these essences would lead to a destruction of the trees, and result in a scarcity and higher cost, was quickly realized, and our table shows that they more than doubled in value by

January, when they had reached the highest point. The labor difficulties and continued cold weather are supposed to have exercised a depressing effect, and in April lower prices were again named.

With a fair business demand the prospects for these essences are excellent for the fall. The bergamot trees are reported greatly damaged by insects. The prospect for the lemon crop is very unfavorable, and orange is said to be almost exhausted. Our prices are for the Sanderson brands.

Oil, Peppermint, contrary to our predictions in last report, advanced during the winter months, reaching \$4.25 in February, from which point it has gradually receded to \$3.20 per pound for Wayne Co. oil in cans. The Michigan crop is reported as seriously affected by the drought, but it is exceedingly difficult to obtain reliable data upon which to base any correct estimate of the future course of this article.

Opium has declined from \$3.40 at the opening of our tabulated report to \$2.90 at its close. Since then, during August the price has been further marked down to \$2.75 by case. The cause for this downward course can readily be understood from the following figures showing receipts, consumption, and estimated stocks available.

Arrivals in Smyrna, 1885-86 crop	4022	
Less re-shipments to Constantinople	142	3880
Arrivals in Constantinople	2300	
Less re-shipments to Smyrna	50	2250
Arrivals in Salonica	700	
Less re shipped to Constantinople and Smyrna	140	560
Stock remaining in interior (of Turkey)		300
Total crop, 1885-86 , ...		6990
Add:		
Stock of opium, June, 1885, in Smyrna	500	
“ “ in Interior	150	
“ “ Constantinople	200	
“ “ London and afloat	2660	
“ “ United States and afloat	300	3810
		10,800
<i>Deduct.</i>		
Actual old stock in Smyrna	650	
“ “ interior	300	
“ “ Constantinople	100	
“ “ England and afloat	3000	
“ “ United States and afloat	600	4650
Total consumption in 1885-86		6150 cases.

From Smyrna.

Note of all opium exported *from Smyrna* to various countries during the year ending July 9th, 1886.

United States	1801
Great Britain	976
Holland	410
France	99
Austria and Germany	98
Italy	12
Spain	45
Singapore, etc	183

3624 cases.

With regard to next season (1886-87) or this year's crop, no accurate account can be obtained, but it is estimated at 8,000 couffes, or say 6500 cases. Add to this the present stocks carried over from last season, and it appears that there is an ample supply.

Sulphate of Quinine and Cinchona Barks.—So much attention has been paid to these articles during the twelve months under review, and so much written concerning them in the trade journals, that I do not deem it advisable to go into details to the same extent as was done in former reports, as all the information I could collect would be from publications which are already familiar to most of you. The prediction in my former report that quinine would continue to rule low has been amply realized, and for the first time in the history of this important salt it has touched the half dollar limit, and is offered at that figure at this writing, in large bulk. From a circular issued by one of the domestic manufacturers, we quote the following in reference to the shipment of barks.

“In 1886, as in several previous seasons, the unusually heavy shipments of cinchona bark from Ceylon have depressed the price of quinine. Up to June 19th, the shipments from Colombo since October 1st, 1885, amounted to 11,750,000 pounds, or as much as during the entire business year ending October 1st, 1885. Shipments from that point continue heavy, having been from June 19th to July 8th, over 1,000,000 pounds. Not only are we confronted by four months' shipments in excess of last year, but the stock of East India bark in London is heavier than ever before.”

On the other hand, it has been reported that the cinchona forests are being devastated and trees uprooted on bark plantations, and that this is proven by the fact that roots accompany barks brought to the London market. It is not believed, however, that this is carried on to any extent. From all that can be learned, therefore, it seems probable that the low prices will continue for the present.

While our table of imports shows a slight decrease in receipts of quinine at the port of New York as compared with the year previous, it

shows an increase in the receipts of cinchona bark, from which we may infer that our domestic manufacturers are holding their own in spite of the disadvantages referred to in our former report.

Senna Leaves, although not quoted in our table, have experienced so marked an advance during the year that it is thought worthy of mention here. The Alexandria variety has been extremely scarce for some time past. This scarcity was first felt about three years ago, at the beginning of the Egyptian troubles. Since then crops have been very small, as local disturbances have prevented the gathering of them. At the present time European markets are said to be practically bare, and there is but little here. The probabilities are in favor of extreme figures. Last year's crop of Tinnevely was almost a failure, and that too is very high in price, choice being now quoted at about 30 cts., in bales.

REPORT OF THE COMMITTEE ON LEGISLATION.

At the last annual meeting, a valuable report on "Legislation on Proprietary Medicines," was presented and accepted by the Association. To the report was attached the draft of a law regulating the sale of these commodities, and also a resolution which was unanimously adopted, in favor of requiring a statement of the constituents upon the labels of proprietary medicines. The report and the action thereon have been placed on the records of the Association; but no provision has been made for communicating the same to the proper authorities, which should be done by order of the Association, if any tangible result is to be expected from the labors of the Committee on Legislation on Proprietary Medicines. With this end in view, and guided by the results of the action of this Association taken in 1867, 1868, and 1869, on the legal regulation of the practice of pharmacy, the Committee on Legislation respectfully offer the following for adoption at the present meeting:

Whereas, All medicines concern the health of those who use them; and

Whereas, The purchaser of a medicine selected by himself has the right to receive information of its constituents and their quantities; and

Whereas, The report and the draft of a law regulating the sale of proprietary medicines, which were accepted by the American Pharmaceutical Association at its meeting held in September, 1885, embrace a method whereby the above-mentioned objects may be secured; therefore be it

Resolved, That the President and other officers of the Association be authorized and instructed to present printed copies of the reports and of the action had in this Association upon said reports, to the Governors, to the Speakers of the Senates and Houses of Representatives, and to the State Boards of Health, of the different States of the United States; also to offer any services wherein these authorities may consider the coöperation of this Association desirable or useful.

During the past year the committee received information of the enactment of a law regulating the practice of pharmacy, in a State where hitherto no special requirements were legally demanded of those engaging in pharmaceutical pursuits. The Pharmacy act of *Virginia*, the result of a four years' struggle, is an act of incorporation of the Virginia Pharmaceutical Association, which body makes annual nominations, from which the Governor appoints the members of the Board of Pharmacy for five years. Those actually engaged in the business, or who had three years' experience in dispensing stores at the time of the passage of the act, are registered as pharmacists without examination; also graduates in pharmacy of colleges recognized by the Virginia Pharmaceutical Association, and licentiates of pharmacy of the State Board. The registration of licentiates of other boards is discretionary. To become a licentiate of pharmacy a practical experience of at least two years preceding the examination is required. The examination fee is \$5; the registration fee of assistants is \$1; that of proprietors \$2; and the annual renewal \$1. Railroad expenses and \$5 per day of actual service are allowed to the members of the Board, who must meet at least once a year. Surplus moneys are to be paid over to the Association. Registered pharmacists are exempt from jury service. Physicians not keeping open shop are not required to register. A poison book must be kept for entering the sales of eight poisons; other deadly poisons, which term is not defined in the law, must be distinctly labeled. Certain drugs and chemicals—among them opium and the iodide, bromide and chlorate of potassium,—also domestic and proprietary medicines, may be sold by merchants without registration; laudanum, morphine and proprietary medicines in packages as obtained from druggists. Adulteration is punished by a fine not exceeding \$100, and forfeiture of registration; the penalty for other offences is a fine not exceeding \$25. Prosecutions are to be conducted by the prosecuting officers of the commonwealth. The first Pharmacy Board, appointed March 15, consists of J. W. Thomas jr., Norfolk; T. Roberts Baker, Richmand; Rob. Brydon, Danville; Edgar Warfield, Alexandria; and E. R. Beckwith, Petersburg.

A pharmacy law is said to have been passed in the Territory of Wyoming, but a copy of it has not been received by the committee.

Three pharmacy laws, namely for Iowa, for New Jersey, and for Kings county, N. Y., were amended during the early part of the present year, and that for Erie county, N. Y., in 1885.

Iowa.—The amendments are as follows: The commissioners of pharmacy receive stationery and blanks from the State, and are empowered to administer oaths and to certify the acknowledgements of instruments in writing (Sec. 3). The sale of liquors for medicinal purposes by pharmacists is regulated by Sect. 8, and Sect. 12 has been altered so as to allow physicians to dispense their own prescriptions without becoming regis-

tered pharmacists, and to permit the unrestricted sale of all proprietary medicines (not merely those manufactured in the State, as provided for by the law of 1882), and of domestic remedies not containing intoxicating liquors or poisons.

New Jersey.—The former law has been entirely remodeled and rendered clearer and more definite in its provisions, which have been given somewhat in detail in the report for 1877 (see Proceedings 1877, p. 659). The main alterations as adopted in the present law are as follows: The Board of Pharmacy is empowered to examine into all cases of alleged abuse, fraud and incompetence. All applicants for registration must prove having had a practical experience of not less than four years; this applies also to graduates in pharmacy and graduates in medicine, the experience of the latter being apparently required to have been had previous to graduation. A pharmacy may be owned by any person, but must always be in charge of a registered pharmacist. As heretofore, only one class of certificates of registration are issued, the grade of "assistant" or "licentiate" not being recognized. Simple domestic remedies may be sold by unregistered retail dealers in rural districts, if located at least one-half mile from a regular pharmacist. All deadly poisons—which term is not defined—are required to be properly labeled with a red label, and the seller must satisfy himself of the proposed legitimate use of the poison; though registration of such sales is not made obligatory, it would seem to be at least very desirable under the provisions of section 6. All fines are to be paid to the Board; and all moneys collected by the Board, after deducting the necessary expenses, as heretofore, are paid over to the New Jersey Pharmaceutical Association.

Kings County, N. Y.—The amendments to the pharmacy act of 1879, which were adopted in 1886, are to be found in sections 1, 2, 3, 4, and 9, and in the appended copy of the law are italicized. They do not involve any material change in the provisions of the original law, but are designed to render these clearer and more precise. Registered assistants are permitted to put up physicians' prescriptions under the general *direction*, without the *immediate supervision*, of a registered pharmacist. The grade of "registered assistant pharmacist" is a new one in name only; but its prerogatives have been clearly defined. The Board of Pharmacy is elected biennially, is required to make proper rules and regulations, and has discretionary power as to the registration of licentiates of other pharmacy boards. Certificates of registration must be conspicuously displayed, and the re-examination of candidates without further fee must take place within six months of the first failure. The assumption by an apprentice or other unregistered person, except under the supervision of a registered pharmacist, of the functions of an assistant, is made a misdemeanor by one of the amendments in section 9; but another amendment

of the same section, as well as of section 1, recognizes also the supervision of a registered assistant pharmacist in the compounding of physicians' prescriptions, though apparently not for the dispensing of drugs, medicines and poisons, for which the registered assistant requires merely the direction, but not the immediate supervision of a registered pharmacist (see Sec. 2).

Erie County, N. Y.—The pharmacy law passed in 1884 was amended in 1885, which fact came to the Committee's notice only after last year's meeting. The amended law does not recognize medical diplomas, as the original law did. Diplomas of colleges of pharmacy in the State of New York are regarded as evidence of qualification; the acceptance of diplomas from foreign institutions is discretionary with the Board; but diplomas of American colleges of pharmacy, outside of New York State, are no longer recognized, and subdivision 3 of Section 2 of the original law, which recognized certificates of registration from other pharmacy boards created by the State of New York, has been omitted from the amended revision; but the acceptance of such certificates, if granted upon examination, as well as of other Boards, including those of foreign countries, rests within the discretion of the Board (Sect. 12). The comparison of these clauses with the corresponding ones in the pharmacy laws for New York City, Kings County, and the remainder of New York State, affords much evidence that there is still no unanimity of views concerning pharmaceutical education and experience; if it were otherwise, the requirements of the four pharmacy laws now in force in the State of New York would not differ in these respects, as they actually do.

The last four sections of the original pharmacy law of Erie County have been omitted, or partly merged with other sections, and the clause of Section 18, permitting the unrestricted sale of "the usual domestic remedies, put up by a pharmacist," etc., has been altered by enumerating the articles, among which are found potassium bichromate and Paris green. Several other amendments are of minor importance.

During the present year several States have enacted laws directing the labeling of all packages containing morphine or its salts with scarlet-colored labels, the names of the contents to be in white letters. The Committee has learned of the passage of such laws in the States of Florida, Georgia, Kentucky, New York, Ohio, and Virginia. Some of these laws require the package also to be enclosed in a scarlet wrapper, and the Ohio law prohibits the dispensing of morphine salts from other than the original bottles, which must contain not more than one drachm each.

Copies of these laws are appended to this report. Their main purpose is evidently to prevent the mistaking of morphine for quinine; but it would seem that equally good reasons might be advanced for including in the provisions of such a law a number of other, if not all, the deadly poisons.

The food and drug adulteration law of the State of New York has been slightly amended May 27, 1886, mainly with the view of reaching directly certain admixtures in candies and a few other articles. The amendments are found in sections two and three, and are here italicized :

SECTION 2. The term "food," as used in this act, shall include every article used for food or drink by man, *including all teas, candies, coffees, and spirituous, fermented and malt liquors.*

SEC. 3. An article shall be deemed to be adulterated within the meaning of this act.

b. In case of food or drink

8. In case of candies, if they contain terra alba, barytes, talc or other mineral substance or poisonous colors or flavors, or other ingredients deleterious or detrimental to health.

In all other respects the law remains as printed in the Proceedings for 1881, p. 394.

Respectfully submitted,

JOHN M. MAISCH,
Chairman.

AMENDED PHARMACY LAW OF IOWA.

CHAPTER 75.

ACTS OF THE EIGHTEENTH GENERAL ASSEMBLY *as amended* BY CHAPTER 137, ACTS OF THE NINETEENTH GENERAL ASSEMBLY, AND CHAPTER 83, ACTS OF THE TWENTY-FIRST GENERAL ASSEMBLY, TO REGULATE SALE OF MEDICINES AND POISONS.

[AN ACT to Regulate the Practice of Pharmacy, and the sale of Medicines and Poisons.]

Be it enacted by the General Assembly of the State of Iowa :

SECTION 1. That from and after the passage of this act it shall be unlawful for any person, not a registered pharmacist within the meaning of this act, to conduct any pharmacy, drug store, apothecary shop or store for the purpose of retailing, compounding or dispensing medicines or poisons for medical use, except as hereinafter provided.

SEC. 2. That it shall be unlawful for the proprietor of any store or pharmacy to allow any person except a registered pharmacist to compound or dispense the prescriptions of physicians, or to retail or dispense poisons for medical use, except as an aid to, and under the supervision of, a registered pharmacist. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be liable to a fine of not less than twenty-five dollars, nor more than one hundred dollars, for each and every such offense.

SEC. 3. The governor, with the advice of the executive council, shall appoint three persons from among the most competent pharmacists of the state, all of whom shall have been residents of the state for five years, and of at least five years' practical experience in their profession, who shall be known and styled as Commissioners of Pharmacy for the state of Iowa; one of whom shall hold his office for one year, one for two years, and the other for three years, and each until his successor shall be appointed and qualified; and each year thereafter another commissioner shall be so appointed for three years, and until a successor be appointed and qualified. If a vacancy occur in said Commission, another shall be appointed, as aforesaid, to fill the unexpired term thereof. Said commissioners shall have power to make by-laws and all necessary regulations for the proper fulfillment of their duties under this act, without expense to the state. *Except that the Secretary of State is authorized to furnish said commissioners with stationery and blanks necessary*

for their office. And said commissioners are authorized to administer oaths, and take and certify the acknowledgements of instruments in writing.

SEC. 4. The Commissioners of Pharmacy shall register in a suitable book, a duplicate of which is to be kept in the Secretary of State's office, the names and places of residence of all persons to whom they issue certificates, and dates thereof. Druggists and pharmacists who were registered without examination forfeit their registration when they have voluntarily sold, parted with, or severed their connection with the drug business for a period of two years at the place designated in certificate of registration. Should such party who has thus forfeited his registration wish to re-engage in the practice of pharmacy, he is required to be registered by examination as per section 5. Every registered pharmacist who desires to continue his profession shall, on or before the 22d day of March of each year, pay to the Commission of Pharmacy the sum of one dollar, for which he shall receive a renewal of his certificate unless his name has been stricken from the register for violation of law. It shall be the duty of each registered pharmacist, before changing his locality as designated in his certificate of registration, to notify the secretary of the Commission of Pharmacy of his new place of business, and for recording the same and certification thereto the secretary shall be entitled to receive fifty cents for each certificate. It shall be the duty of every registered pharmacist to conspicuously post his certificate of registration in his place of business. Any person continuing in business, who shall fail or neglect to procure his annual renewal of registration, or who shall change his place of business without complying with this section, or who shall fail to conspicuously post his certificate of registration in his place of business, shall for each such offense be liable to a fine of ten dollars for each calendar month during which he is so delinquent.

SEC. 5. That the said Commissioners of Pharmacy shall, upon application, and at such time and place, and in such manner as they may determine, examine, either by a schedule of questions, to be answered and subscribed to under oath, or orally, each and every person who shall desire to conduct the business of selling at retail, compounding or dispensing drugs, medicines or chemicals for medicinal use, or compounding or dispensing physicians' prescriptions as pharmacists, and if a majority of said commissioners shall be satisfied that said person is competent and fully qualified to conduct said business of compounding or dispensing drugs, medicines or chemicals for medicinal use, or to compound and dispense physicians' prescriptions, they shall enter the name of such person as a registered pharmacist in the book provided for in section 4 of this act; and that all graduates in pharmacy, having a diploma from an incorporated college or school of pharmacy that requires a practical experience in pharmacy of not less than four years before granting a diploma, shall be entitled to have their names registered as pharmacists by said Commissioners of Pharmacy without examination.

SEC. 6. That the Commissioners of Pharmacy shall be entitled to demand and receive from each person whom they register and furnish a certificate as a registered pharmacist, without examination, the sum of two dollars; and from each and every person whom they examine orally, or whose answers to a schedule of questions are returned subscribed to under oath, the sum of five dollars, which shall be in full for all services. And in case the examination of said person shall prove defective and unsatisfactory, and his name not be registered, he shall be permitted to present himself for re-examination within any period not exceeding twelve months next thereafter, and no charge shall be made for such re-examination.

SEC. 7. Every registered pharmacist shall be held responsible for the quality of all drugs, chemicals and medicines he may sell or dispense, with the exception of those sold in the original packages of the manufacturer, and also those known as "patent medicines;" and should he knowingly, intentionally and fraudulently adulterate, or cause to

be adulterated, such drugs, chemicals or medicinal preparations, he shall be deemed guilty of a misdemeanor, and, upon conviction thereof, be liable to a penalty not exceeding one hundred dollars, and in addition thereto, his name be stricken from the register.

SECTION 8. *Pharmacists whose certificates of registration are in full force and effect, shall have the sole right to keep and to sell under such regulations as have been or may be established from time to time by the Commissioners of Pharmacy, all medicines and poisons, including intoxicating liquors only for the actual necessities of medicine; provided that such pharmacists shall have procured permits therefor as hereinafter prescribed. Provided further, that nothing herein contained shall be so construed as to shield the person who in any wise abuses this trust, for the legitimate and actual necessities of medicine only, from the utmost rigors of the law, now or hereafter in force relating to intoxicating liquors, and in addition thereto, for a second violation thereof, his name shall be stricken from the register by the Commissioners of Pharmacy upon receipt of transcript of conviction, which shall be transmitted by the court or by order of the court, before whom conviction is had. Twenty-five per cent. of all moneys recovered as fines under the provisions of this act shall be paid into the state treasury, and reported to the state auditor, and held subject to the order of the Commissioners of Pharmacy as needed, to be by them used solely to defray the expenses of prosecutions under, and the enforcement of this act or acts to which this is amendatory. In order to procure a permit to sell intoxicating liquors as aforesaid, and a shipping permit, he shall present to such board of supervisors a petition signed by at least one-fourth of the freeholders having the qualification of electors of the township, town or ward wherein such business is located, certifying that the registered pharmacist applying is a person of good moral character, is not a minor, and is, and for the six months last preceding has been, lawfully conducting a pharmacy as proprietor in such township, town or ward, and that they believe him to be a proper person to buy and sell intoxicating liquors for the purposes named in this act. The board being satisfied that all the provisions of the law have been complied with, a permit shall be issued. Provided, however, that any resident of the township, town or ward may appear and show cause why such permit should not be granted, and the same shall be refused, unless the board are fully satisfied that all the requirements of the law have been complied with, ten days' notice of the time of granting such permit having been given by publication in a newspaper published in the county, or by posting notices in the township, town or ward in which the business is to be conducted. The county auditor shall issue to such pharmacist, his certificate of registration and his permit to buy and sell, being in full force and effect a permit to receive intoxicating liquors within the county in which he does business, and the presentation of said permit to any railway company, express company or common carrier within the borders or traversing the territory of the state, shall convey full authority to receive, transport and deliver intoxicating liquors to the person named in such permit; provided, that such permit shall be for specified packages and kinds of liquors, and that a certified copy of such permit shall be kept on file in the office of the auditor issuing the same. The Commissioners of Pharmacy shall, on the revocation or forfeiture of any certificate of registration, subsequent to their last biennial report or abstract of the state pharmacy register, report such revocation or forfeiture to the county auditor of the county wherein such certificate was last in force. On or before the tenth day of each month said pharmacist shall make to the county auditor a complete report, verified by his affidavit, specifically showing all sales of intoxicating liquors made during the preceding calendar month, to whom sold, and the purpose for which the same was to be used, as represented by duplicate applications executed by each purchaser. The registered pharmacist to whom application is made shall refuse to execute same, if he has reason to believe the application is not made in good faith, and that the liquor would be used as a beverage. He shall not accept an application from a*

minor, or from any person who is in the habit of becoming intoxicated, or when any relative of such person has given written notice to said pharmacist that such person uses intoxicating liquors as a beverage. The drinking of intoxicating liquor in a pharmacy, whether under a permit or not, shall be presumptive evidence that the same was sold or given away by such pharmacist contrary to law.

SEC. 9. It shall be unlawful for any person, from and after the passage of this act, to retail any poisons enumerated in schedules "A" and "B," except as follows:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnia, and all other poisonous vegetable alkaloids and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce.

SCHEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitalis, and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid and oxalic acid, without distinctly labeling the box, vessel or paper in which the said poison is contained, and also the outside wrapper or cover, with the name of the article, the word "poison," and the name and place of business of the seller. Nor shall it be lawful for any person to sell or deliver any poison enumerated in Schedules "A" and "B" unless, upon due inquiry, it be found that the purchaser is aware of its poisonous character, and represents that it is to be used for a legitimate purpose. Nor shall it be lawful for any registered pharmacist to sell any poisons included in schedule "A" without, before delivering the same to the purchaser, causing an entry to be made in a book kept for that purpose, stating the date of sale, the name and address of the purchaser, the name of the poison sold, the purpose for which it is represented by the purchaser to be required, and the name of the dispenser; such book to be always open for inspection by the proper authorities, and to be preserved for at least five years. The provisions of this section shall not apply to the dispensing of poisons, in not unusual quantities or doses, upon the prescriptions of practitioners of medicine. Nor shall it be lawful for any licensed or registered druggist or pharmacist to retail, or sell, or give away, any alcoholic liquors or compounds as a beverage, and any violation of the provisions of this section shall make the owner or principal of said store or pharmacy liable to a fine of not less than twenty-five dollars and not more than one hundred dollars, to be collected in the usual manner; and, in addition thereto, for repeated violations of this section, his name shall be stricken from the register.

SEC. 10. Any itinerant vender of any drug, nostrum, ointment or appliance of any kind, intended for the treatment of diseases or injury, who shall, by writing or printing, or any other method, publicly profess to cure or treat diseases, or injury, or deformity, by any drug, nostrum, or manipulation, or other expedient, shall pay a license of one hundred dollars per annum, to be paid to the treasurer of the Commission of Pharmacy, whereupon the secretary of said commission shall issue such license for one year. Any person violating this section shall be deemed guilty of a misdemeanor, and shall, upon conviction, pay a fine of not less than one hundred nor more than two hundred dollars; all moneys received for licenses to be reported to the auditor of state. The sum of two thousand dollars per year, or as much thereof as may be necessary, is hereby appropriated out of the moneys so received for licenses for the expenses of said commission, all exceeding said amount to be paid into the state treasury.

SEC. 11. That any person who shall procure, or attempt to procure, registration for

himself or for another under this act, by making or causing to be made, any false representations, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be liable to a penalty of not less than twenty-five nor more than one hundred dollars, and the name of the person so fraudulently registered shall be stricken from the register. Any person, not a registered pharmacist, as provided for in this act, who shall conduct a store, pharmacy, or place for retailing, compounding or dispensing drugs, medicines or chemicals, for medicinal use, or for compounding or dispensing physicians' prescriptions, or who shall take, use or exhibit the title of registered pharmacist, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be liable to a penalty of not less than fifty dollars nor more than two hundred dollars.

SEC. 12. *Physicians dispensing their own prescriptions only, are not required to be registered pharmacists. Provided, that nothing in this act (chapter 83, laws 1886), shall prevent any person not a registered pharmacist or not holding a permit, from keeping and selling proprietary medicines, and such other domestic remedies as do not include any intoxicating liquors or poisons.*

SEC. 13. This act, being deemed of immediate importance, shall take effect from and after its publication in the Iowa State Register and Iowa State Leader, newspapers published at Des Moines, Iowa.

SEC. 14. All acts and parts of acts in conflict with this act, are hereby repealed.

Original Act, chapter 75, approved March 22, 1880, published in the Iowa State Leader, March 27, 1880, and in the Iowa State Register, March 31, 1880. (See Proceedings 1880, p. 578.)

Chapter 137, approved March 17, 1882, published in the Iowa State Leader and the Iowa State Register, March 18, 1882. (See Proceedings 1882, p. 486.)

Chapter 83, approved April 7, 1886, published in the Iowa State Leader and the Iowa State Register, April 8, 1886.

REVISED PHARMACY LAW OF NEW JERSEY.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY IN THE STATE OF NEW JERSEY.

(APPROVED APRIL 5, 1886.—CHAPTER CXXIII.)

1. *Be it enacted* by the Senate and General Assembly of the State of New Jersey, That from and after the passage of this act, it shall not be lawful for any person not a registered pharmacist, within the meaning of this act, to conduct any store or pharmacy for retailing, dispensing or compounding drugs, medicines or poisons, or for any one not a registered pharmacist to prepare and dispense physicians' prescriptions, or to retail or dispense medicines or poisons, except under the immediate supervision of a registered pharmacist.

2. *And be it enacted*, That on or before the first day of June next, the New Jersey Pharmaceutical Association shall submit to the Governor the names of fifteen pharmacists doing business within this State, from which number the Governor shall appoint five persons, who shall constitute the Board of Pharmacy of the State of New Jersey, and who shall hold office for the term of one, two, three, four and five years, as designated in their respective appointments, and until their successors shall have been appointed and qualified; the New Jersey Pharmaceutical Association shall annually thereafter nominate to the Governor five pharmacists, of whom the Governor shall appoint one to fill the vacancy annually occurring in the said Board, who shall hold office for five years and until his successor shall have been appointed and qualified; any vacancy occurring in said Board shall be filled by the Governor for the unexpired term from among the persons last nominated to him; each person so appointed shall, within thirty days after appointment, take and subscribe an oath, before any officer authorized to administer oaths in the State, that he will faithfully and impartially discharge the duties prescribed by this act.

3. *And be it enacted*, That the Board of Pharmacy shall organize by electing a President, a Secretary, and a Treasurer, and shall have power to make by-laws and rules for the proper fulfillment of its duties under this act; it shall meet at least once in three months, alternately in the cities of Paterson, Newark, Trenton and Camden, and shall give thirty days' notice of the time and place of such meetings; it shall examine into all applications for registration, and grant certificates of registration to pharmacists having diplomas from colleges of pharmacy, or regularly chartered medical colleges, granted on four years' practical experience, and to such other persons as it shall judge, on examination, to be properly qualified to practice pharmacy; it shall keep a book of registration, in which shall be entered the names and places of business of all persons registered under this act, and shall also keep a book of record of all its official transactions, which book shall be legal evidence of such transactions in any court of law; it shall have power to examine into all cases of alleged abuse, fraud and incompetence, cause the prosecution of all persons not complying with the provisions of this act, and suspend and revoke the registration of any person legally convicted of violating the same; it shall report annually to the Governor and the President of the New Jersey Pharmaceutical Association upon the condition of pharmacy in the State, which report shall embrace a detailed statement of the receipts and expenditures of the Board; the members of such Board shall receive the sum of five dollars for each day actually engaged in this service, to be paid from the fees and penalties collected under the provisions of this act, and all moneys thus collected by said Board in excess of said per diem allowance and of the necessary expense of said Board, shall be paid to the Treasurer of the New Jersey Pharmaceutical Association at its annual meeting; three members of the Board shall constitute a quorum.

4. *And be it enacted*, That every person applying for registration under this act shall furnish satisfactory evidence that he has had at least four years' experience in the practice of pharmacy, and pay to the Treasurer of the Board of Pharmacy a fee of five dollars, and, upon passing an examination satisfactory to said Board, he shall receive from said Board a certificate of registration; in case of failure to pass a satisfactory examination, the applicant shall be granted a second examination (without the payment of another fee) at any time within six months from his first examination; the registration fee to pharmacists having the diplomas mentioned in section three shall be two dollars; every pharmacist owning or conducting a pharmacy or store, shall conspicuously display his certificate of registration in said pharmacy or store, and any failure to do so shall be *prima facie* evidence that such person is not a registered pharmacist.

5. *And be it enacted*, That any person who shall procure or attempt to procure registration for himself or any other person under this act, by making or causing to be made any false representations, or fraudulently represent himself to be registered, or shall adulterate or shall sell any adulterated drug, medicine or chemical, or who shall otherwise violate the provisions of this act (except section six), shall be deemed guilty of a misdemeanor, and, upon conviction thereof, be liable to a penalty of not less than fifty or more than one hundred dollars, and for every subsequent offense or offenses, a like fine or imprisonment, not to exceed six months, or both, at the discretion of the court.

6. *And be it enacted*, That it shall not be lawful for any person to retail or dispense any of the poisons enumerated in Schedule A appended to this section, or any other substance commonly recognized as a deadly poison, without distinctly labeling with a red label the bottle, box, vessel or wrapper in which such poison is contained, with the name of the article, the word "poison," and the name and place of business of the dispenser, nor without being satisfied that the purchaser is aware of its poisonous nature and intends to use it for a legitimate purpose; any person failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor, and for every such omission shall

be liable to a fine of not less than ten dollars; and any person who shall give a fictitious name, or who shall make any false representation to the seller when buying any of the poisons thus enumerated, shall be deemed guilty of a misdemeanor and be liable to a fine of not less than ten dollars; the penal provisions of this act shall not apply to the sale of such poisons as are used in the arts, agriculture, or in manufacturing, to persons known to be engaged in such pursuits, nor to the dispensing of poisons upon the prescription of a practicing physician.

SCHEDULE A.

Arsenic and its compounds or chemical derivatives; corrosive sublimate and other poisonous derivatives of mercury; phosphorus and its poisonous derivatives; prussic acid and its poisonous derivatives; taurate of antimony; essential oil of bitter almonds; oils of tansy, savin or croton; chloroform, chloral hydrate, aconite, belladonna, conium, cantharides, digitalis, hyoscyamus, nux vomica, Indian hemp, veratrum viride, yellow jessamine, opium, their alkaloids or other preparations (except pægoric and other preparations of opium having less than two grains to the ounce), ergot, savin, cotton root and their preparations.

7. *And be it enacted*, That nothing in this act shall be construed to apply to or in any manner interfere with the strictly professional pursuits of any physician, nor with the making or vending of patent or proprietary medicines, nor with the sale of simple domestic remedies by retail dealers in rural districts, one half mile or more remote from a regular pharmacist, nor with the ownership of any pharmacy or store in part or whole by any person not a registered pharmacist; *Provided*, such pharmacy or store be at all times in charge of a registered pharmacist; and any person holding a certificate of registration granted under any former act shall be considered a registered pharmacist within the meaning of this act.

8. *And be it enacted*, That each and every fine imposed under this act shall be paid to the treasurer of the Board of Pharmacy.

9. *And be it enacted*, That this act shall be a public act and shall take effect immediately; *Provided*, That the organization of the Board, as prescribed in section three hereof, may be had and effected at any time within thirty days from the date of appointment of its members by the governor.

10. *And be it enacted*, That all acts and parts of acts conflicting with this act are hereby repealed.

AMENDED PHARMACY LAW OF ERIE COUNTY, N. Y.

AN ACT TO REGULATE THE PRACTICE OF PHARMACY, THE LICENSING OF PERSONS TO CARRY ON SUCH PRACTICE, AND THE SALE OF POISONS IN THE COUNTY OF ERIE.

CHAPTER 207, 1884, WITH AMENDMENTS. CHAPTER 72 OF 1885.

SECTION I. 1. From and after the passage of this act it shall be unlawful for any person to open or carry on, within the county of Erie, any pharmacy or store for the purpose of retailing, compounding or dispensing drugs, medicines or poisons, unless such person shall be, or shall employ and place in charge of said pharmacy or store, a registered pharmacist within the meaning of this act, except as hereinafter provided.

2. And it shall be unlawful for any person to be employed for the purpose of compounding or dispensing drugs or medicines, or retailing poisons, within said county, by the proprietor of a pharmacy or store, unless such person shall hold a license as a pharmacist or assistant pharmacist, obtained as hereinafter provided.

SEC. 2. Any person, upon the application to the Board of Pharmacy, as hereinafter provided, shall be granted a license by such Board as a pharmacist, on compliance with the requirements hereinafter stated, as follows:

1. If such person, at the time of the passage of this act, shall be carrying on upon his own account the business of dispensing or retailing drugs, medicines or poisons, or practicing pharmacy on his own account, within said county of Erie.

2. Or if such person has had at least four years' practical experience where physicians' prescriptions are dispensed, and has obtained a diploma from some legally constituted college of pharmacy of this State, or from some foreign institution deemed by the Board created by this act to be of sufficient rank and requirements.

3. Or if such person has had at least four years' practical experience where physicians' prescriptions are dispensed, and shall pass a satisfactory examination for the grade of pharmacist before said Board of Pharmacy.

SEC. 3. Any person, upon application to the Board of Pharmacy, as hereinafter provided, may be granted a license by such Board as an assistant pharmacist, on compliance with the requirements, hereinafter stated, as follows :

1. If such person holds a certificate of registration as an assistant pharmacist, of corresponding grade, from any Board of Pharmacy legally created under the laws of this State.

2. Or, if such person is actually engaged, at the time of the passage of this act, in the business of dispensing medicines and poisons, and shall have had at least two years' practical experience in compounding medicines and dispensing physicians' prescriptions.

3. Or, if such person has had at least three years' practical experience where physicians' prescriptions are dispensed, and shall pass satisfactory examination for the grade of assistant pharmacist before said Board of Pharmacy.

SEC. 4. Any person entitled to a license as a pharmacist, under subdivision first or second of section two of this act, shall make a written application to the Board of Pharmacy created by this act, for such license, accompanied by a written statement signed by him and duly verified before an officer authorized to administer oaths within this State, fully setting forth the grounds entitling him to such license. Said applicant shall exhibit to said Board of Pharmacy, if required by them to do so, any college diploma or certificate upon which he shall claim a license, together with any further proofs of his right to such license which said Board may require. If the Board determine that the applicant is entitled to a license, it shall issue the same, authorizing him to practice as a pharmacist in the county of Erie. Such license shall not be granted unless the application therefor shall be accompanied by the sum of five dollars. Every person entitled to a license under subdivision first of section two of this act who shall not apply for a license as required by this section, before August first, eighteen hundred and eighty-five, shall thereby forfeit his right to such license, until he shall have passed an examination satisfactory to said Board.

SEC. 5. Any person entitled to a license as a pharmacist under subdivision third of section two of this act, and desiring to practice pharmacy within Erie county, shall make a written application to the Board of Pharmacy, hereinafter provided for, for an examination and license. Such application shall be accompanied by a written statement, signed by the applicant and verified before an officer authorized to administer oaths within this State, setting forth the necessary facts required by said subdivision, to entitle him to such license, and shall make such further proofs of said facts as said Board may require. Such application shall be also accompanied by the sum of seven dollars, upon the receipt of which the said Board shall, if in session, and if not, at the next meeting thereof, examine such applicant, and if such Board are satisfied that he has the requisite knowledge and experience, it shall grant him a license to practice as a pharmacist within the said county of Erie.

SEC. 6. Any person carrying on any pharmacy or store within said county of Erie, either as principal or agent, for the purpose or any of the purposes described in subdivis-

ion first of section one of this act, without having duly obtained a license as a pharmacist as required by this act, shall be guilty of a misdemeanor.

SEC. 7. Any person entitled to apply for a license as an assistant pharmacist under subdivision first of section three of this act, shall within ninety days after the official publication of the organization of the Board of Pharmacy, make written application to said Board for a license, accompanied by a written statement signed by him, and duly verified before an officer authorized to administer oaths within this State, fully setting forth the grounds entitling him to such a license. Said application shall be accompanied by the sum of three dollars, and upon its receipt the said Board may, if in session, and if not, at its next meeting, grant him a license to practice as an assistant pharmacist within the said county of Erie, but if he shall fail to make the application required by this section within ninety days after the organization of said Board of Pharmacy, he shall then be required to pass an examination satisfactory to a majority of said Board. Any person not entitled to apply for a license under said subdivisions first and second of section three of this act, as an assistant pharmacist, and desiring a license as such, shall make a written application for the same to the Board of Pharmacy, hereinafter provided for, accompanied by a written statement signed by him, and duly verified before an officer authorized to administer oaths within this State, fully setting forth the facts required by subdivision third of section three of this act, to entitle him to apply for a license as an assistant pharmacist. Such application shall be accompanied by the sum of five dollars, and upon its receipt the said Board shall, if in session, and if not, at its next meeting, examine said applicant, and if satisfied that such applicant has the requisite knowledge and experience, it shall grant him a license to practice as an assistant pharmacist within said county of Erie.

SEC. 8. Any person employed in any pharmacy or store, for the purpose described in subdivision second of section one of this act, or any person knowingly employing any person for such purposes, without such person so employed being duly licensed as a pharmacist or assistant pharmacist, as required by this act, shall be guilty of a misdemeanor.

SEC. 9. There shall be established and created in and for Erie county, a Board of Pharmacy in the following manner: Within sixty days after the passage of this act, the President and Secretary of the Erie County Pharmaceutical Association shall call a meeting of the members of said Association, the time and place for holding said meeting to be duly published in three issues of the official paper of the county, and at such meeting there shall be designated by ballot ten reputable pharmacists doing business within said county of Erie, each of whom shall have had not less than ten years' experience as a dispensing druggist or pharmacist. Notice of such designation and the names of the parties so designated shall then be filed with the county judge of said county, and from the persons so designated he shall appoint five, who shall constitute the Board of Pharmacy for the county of Erie. The members of the Board first appointed under this section shall hold office for the term of one, two, three, four and five years respectively, as hereinafter provided, and until their successors have been duly appointed and qualified. The Erie County Pharmaceutical Association shall annually thereafter, in the manner prescribed in this section, elect or designate three reputable registered pharmacists doing business within the said county of Erie, from which number the county judge shall, in each case, fill the vacancy annually occurring in the Board, the appointments under this subdivision being for the full term of five years; provided, however, at the election or designation of nominees hereinbefore provided for, any registered pharmacist or assistant pharmacist of Erie county shall have the right to cast his ballot, and the same shall be duly counted, whether he be a member of said Association or not. In case of the death, resignation, inability or removal from the county of any

member of the Board before the expiration of his term of office, or in case of any vacancy occurring from any other cause but expiration of term of office, the remaining surviving members of the Board shall fill the vacancy from the list of names last submitted, and the appointee shall be a member of the Board for the remainder of the term of his predecessor.

SEC. 10. It shall be the duty of the members of the Board of Pharmacy created by this act, immediately after the receipt of the notification of their appointment, to appear before the clerk of the county, and make and subscribe to an oath properly and faithfully to discharge the duties of their office. And within ten days after the receipt of the notification of their appointment they shall meet and organize, and shall thereupon publish a notice of the organization so effected, for one week in the official paper of the county, giving full and explicit information to whom applications for registration and licenses must be addressed. The term of office of the several members first appointed under section nine shall be determined by lot. They shall immediately thereafter proceed to organize by electing a president and secretary, who shall hold their offices for one year, and until their successors are elected. The Board shall hold meetings at least once in three months, or as much oftener as the business of the Board may require. The secretary shall give each member of the Board not less than five days' notice of each meeting. Three members shall constitute a quorum.

SEC. 11. It shall be the duty of the Board to examine all persons applying for examination under this act, and to grant licenses to such persons as may be entitled to a license according to the provisions of this act. It shall be the duty of the Board to investigate all complaints of disregard, non compliance or violation of the provisions of this act, and to bring the same to the notice of the proper prosecuting officer, as provided for in this act, whenever there appear to the Board reasonable grounds for such action.

SEC. 12. *Certificates granted upon examination by Boards of Pharmacy created under the laws of this or any other State or foreign country may be recognized by the Board of Pharmacy created by this act, and licenses may be granted thereon in the discretion of such Board.* The license under which any pharmacist, within the meaning of this act, practices his profession, shall *at all times* be conspicuously displayed in the pharmacy or store in which he does business. Any failure to comply with this requirement is a misdemeanor.

SEC. 13. There shall be two standards or grades of examination: One for pharmacist, which shall be conducted with a view to ascertain the fitness of the individual to act independently as principal or in sole charge of a pharmacy where physicians' prescriptions are dispensed, and where drugs, medicines and poisons are sold. Another for assistant pharmacist, which shall be conducted with a view to ascertain the fitness of the individual to compound and dispense physicians' prescriptions, and to be intrusted with the handling, care and sale of poisons, under the direction of a licensed pharmacist. In case of failure to pass a satisfactory examination, a second examination shall be granted within six months without further payment. But for any or all further examinations there shall be paid the same fee as for the first examination.

SEC. 14. It shall be the duty of the secretary of the Board of Pharmacy created by this act to provide and keep a book of registration in some convenient place, in which shall be entered all applications for registration and examination; said record to embrace the name and place of business of the applicant, the purpose of the application, the facts justifying the claim, and the action of the Board in each case. It shall be the duty of the secretary of the Board of Pharmacy also to keep on file in the office of the county clerk, in a book to be provided by the said county clerk, a record of all registrations made or licenses issued, giving the name and address of persons so registered and the grade of

registration. It shall be the duty of the secretary of the Board of Pharmacy to safely keep all books, papers and records pertaining to the Board, and at the expiration of his term of office deliver the same, together with any unexpended funds of the Board, to his successor in office.

SEC. 15. The members of the Board of Pharmacy created by this act shall receive a sum not exceeding three dollars for each day engaged in the services of the Board, and all legitimate and necessary disbursements. The secretary shall receive such additional compensation as the Board may direct. All moneys shall be held by its secretary for meeting the expenses of said Board, he giving such bonds as the Board may, from time to time, direct. All expenses incurred by said Board shall be paid out of the fees collected under this act.

SEC. 15. From and after the passage of this act, it shall be unlawful for any person within the said county of Erie to sell at retail or furnish any of the poisons named in the schedules hereinafter set forth, without affixing, or causing to be affixed, to the box, bottle, vessel or package, a label containing the name of the article, and the word "poison" distinctly shown, with the name and place of business of the seller, all printed in red ink, together with the name of such poisons printed or written thereupon in plainly legible characters; which schedules are as follows, to wit:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, cyanide of potassium, hydrochloric acid, oil of bitter almonds, strychnia, morphia, and all other poisonous alkaloids and their salts; opium and its preparations containing more than two grains of opium, or its equivalent, to the ounce.

SCHEDULE B.

Aconite, belladonna, cantharides, colchicum, conium, cotton root, creosote, digitalis, ergot, henbane, nux vomica, savin, and their pharmaceutical preparations; chloral hydrate, chloroform, croton oil, carbolic acid, oil of tansy, white precipitate, liniodide of mercury, oxalic acid, sulphate of zinc, acetate of lead and the mineral acids.

Every person who shall sell or dispense at retail, or furnish any poisons included under Schedule A, shall, before delivering the same, make, or cause to be made, an entry in a book kept for that purpose, stating the date of the sale, the name and address of the purchaser, the name and the quantity of the poison, the purpose for which it is represented by the purchaser to be required, and the name of the dispenser; such book to be always open for investigation by the proper authorities, and to be preserved for at least five years after the last entry. He shall not deliver any of said poisons without satisfying himself that the purchaser is aware of its poisonous character, and that the said poison is to be used for a legitimate purpose. The foregoing portions of this section shall not apply to the dispensing of medicines or poisons on physicians' prescriptions. Wholesale dealers in drugs, medicines, pharmaceutical preparations or chemicals, shall affix, or cause to be affixed to every bottle, box, parcel, or outer inclosure of an original package, containing any of the articles enumerated in schedule A of this act, a suitable label or brand with the word "poison" upon it; but they are hereby exempt from any registration of the sale of such articles, when in the usually recognized wholesale quantities. Any person failing to comply with the requirements of this section shall be guilty of a misdemeanor.

SEC. 17. Any person who shall procure or attempt to procure a license under this act, by making, or causing to be made, any false or fraudulent representation, shall be guilty of a misdemeanor. *Every license obtained from said Board by any false or fraudulent representation shall be void, and shall be declared cancelled by said Board, after giving the licensee an opportunity to be heard; and such licensee shall thereupon surrender his license to said Board.*

SEC. 18. Nothing in this act, *except that portion of section sixteen which relates to the labeling or marking of certain poisons*, shall apply to the business of practitioner of medicine, who does not keep a store for the retailing of medicines or poisons, nor to the exclusively wholesale business of any dealers, *nor to the selling, at any store, of copperas, borax, vitriol, saltpetre, sulphur, licorice, sage, juniper berries, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerin, Glauber's salts, Epsom salt, cream of tartar, sodium bicarbonate, paregoric, essence of peppermint, essence of cinnamon, essence of ginger, hive syrup, syrup of ipecac, tincture of arnica, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, bichromate of potash, or Paris green.* And nothing in this act shall prevent or prohibit the employment, in any pharmacy, of apprentices or junior assistants, for the purpose of being instructed in the practice of pharmacy; but such apprentices or junior assistants shall not be permitted to prepare and dispense physicians' prescriptions, or to sell or furnish poisons, except in the presence of, and under the personal supervision of a licensed pharmacist. And nothing in this act shall prohibit the manufacture or sale of patent or proprietary medicines.

AMENDED PHARMACY LAW OF KINGS COUNTY, N. Y.

AN ACT GOVERNING THE SALE OF DRUGS AND POISONS IN THE COUNTY OF KINGS, STATE OF NEW YORK.

CHAP. 502, LAWS 1879 AS AMENDED; CHAP. 272, LAWS 1886.

SECTION 1. It shall be unlawful from and after the first day of October, 1879, for any person, unless a registered pharmacist, within the meaning of this act, to open or conduct any pharmacy or store for retailing, dispensing or compounding medicines or poisons, or for any one not a registered pharmacist, *or registered as istant pharmacist* to prepare physicians' prescriptions, except under the *immediate* supervision of a registered pharmacist, *or registered assistant pharmacist*, in the county of Kings.

SEC. 2. Any person, in order to be registered, shall be either a graduate in pharmacy, a graduate in medicine, *or a licentiate in pharmacy, or shall have passed a satisfactory examination before the Board of Pharmacy of the County of Kings, and received from them a certificate of qualification for either that of pharmacist, which shall entitle the person to act as principal; or that of assistant pharmacist, which shall on'y entitle the person to compound medicines and physicians' prescriptions, and dispense drugs, medicines and poisons under the direction of a registered pharmacist. Licentiates of other Boards of Pharmacy, or legally constituted pharmaceutical bodies, may be registered by the Board of Pharmacy of the county of Kings, if said Board deem such action proper.*

SEC. 3. Graduates of pharmacy and graduates of medicine under the requirements of this act, must have had at least four years' *practical* experience in stores where prescriptions of medical practitioners have been compounded, and have obtained a diploma from some legally constituted college of pharmacy or medicine. Licentiates in pharmacy must have had *before examination* four years' *practical* experience in stores where prescriptions of medical practitioners have been prepared, and shall have passed a satisfactory examination before the Board of Pharmacy of the county of Kings, or before any other Board of Pharmacy, *or any other legally constituted pharmaceutical body recogniz'd by the Board of Pharmacy of the County of Kings.*

SEC. 4. The Board of Pharmacy of the County of Kings shall consist of five members, two of whom shall be pharmacists qualified for registration as aforesaid, to be elected by the Kings County Pharmaceutical Society, at a special meeting to be called for the purpose, within two weeks after the passage of this act; two practitioners of medicine to be elected by the Medical Society of the County of Kings, at its next stated meeting after the passage of this act, and a pharmacist, who shall also be a secretary of the Board, to be

elected by the joint ballot of the members elected as herein provided for. *Such officers shall be elected triennially thereafter in a similar manner.* The members of such Board shall, within thirty days after their election as aforesaid, individually take and subscribe before the clerk of the County of Kings an oath faithfully and impartially to discharge the duties prescribed for them by this act. They shall hold office for the term of three years, and until their successors are duly elected and qualified, and in case of vacancy, it shall be filled in the manner herein provided, *to wit: within ninety days of its occurrence the body which elected the person whose place is to be filled shall elect his successor at a meeting, of the purport of which due notice shall be given.*

The Board shall organize by the election of a president to serve for the full term. The board shall meet at least once every three months, and three members shall constitute a quorum. The duties of the board shall be to examine and register pharmacists and assistant pharmacists in the regular order of their application, to transact all business pertaining to the legal regulation of the practice of pharmacy in said county, and to examine into and adjudicate upon all cases of alleged abuse, fraud, malpractice or incompetence, *to make such rules and regulations not inconsistent with the laws of this State, as it may find necessary to carry into effect the provisions of this act,* and it shall be competent for the said Board, by a vote of three-fifths of its members, to suspend or revoke the registration of any practicing pharmacist, *or a sistant pharmacist,* after due notice and trial before said Board. It shall be the duty of all persons not exempt therefrom by the provisions of this act to appear and apply for examination within ninety days after the organization of the board. And any person so applying shall furnish to the Board satisfactory evidence that he has had at least four years' experience in the compounding of physicians' prescriptions and in the general duties of pharmacy, and shall pay to the Secretary of the Board a fee of five dollars. And should he pass such examination satisfactorily, he shall be furnished with a certificate as to his competency and qualifications, signed by the members of the Board of Pharmacy, which certificate shall be his warrant for registration. *All persons registered by this Board shall, upon payment of the prescribed fee, receive from this Board a certificate of registration, and such certificate of registration shall be conspicuously displayed in the store or place where the person holding the same is engaged.* In case of failure to pass a satisfactory examination, he shall be granted a second examination without the payment of further fee, *provided he present himself for re-examination within six months.*

SEC. 5. It shall be the duty of the Secretary to keep a book of registration at some convenient place, of which due notice shall be given through the public press, in which shall be entered under the supervision of the Board the names and places of business of all persons coming under the provisions of this act, and a statement to be signed by the person making the application of such facts in the case as he may claim to justify his application. The fee for registration of those in business for themselves shall not exceed two dollars, and for those in the employ of others shall not exceed one dollar. The Secretary shall give receipts for all moneys received by him, and pay over the same to the Treasurer of the Kings County Pharmaceutical Society, taking his receipt therefor, which moneys shall be used for the purpose of defraying the expenses of the Board of Pharmacy, and any surplus shall be for the benefit of said Society. The salary of the Secretary shall be fixed by the Board, and shall be paid out of the fees for examination and registration.

SEC. 6. Every registered pharmacist from and after the first day of October, 1879, shall be held responsible for the quality of all drugs, chemicals and medicines he may sell or dispense, with the exception of those sold in the original packages of the manufacturers, and also those known as "patent medicines," and should he knowingly, inten-

tionally and fraudulently adulterate, or cause to be adulterated, such drugs, chemicals, or medicinal preparations, he shall be deemed guilty of a misdemeanor, and upon conviction thereof, be liable to a penalty not exceeding one hundred dollars, and in addition thereto his name shall be stricken from the register.

SEC. 7. It shall be unlawful for any person from and after the first day of October, 1879, to retail any poisons enumerated in Schedules A and B, as follows, to wit:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnia, and all other poisonous vegetable alkaloids and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric, and other preparations of opium containing less than two grains to the ounce.

SCHEDULE B.

Aconite, belladonna, colchicum, nux vomica, henbane, savin, ergot, cotton-root, cantharides, creosote, digitalis, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid, oxalic acid, and their pharmaceutical preparations, without distinctly labeling the bottle, box, vessel or paper in which the said poison is contained, and also the outside wrapper or cover, with the name of the article, the word "poison," and the name and place of business of the seller; nor shall it be lawful for any person to sell or deliver any poison enumerated in said schedules A and B, unless upon due inquiry it be found that the purchaser is aware of its poisonous nature, and represents that it is to be used for a legitimate purpose. Nor shall it be lawful for any registered pharmacist to sell any poisons included in schedule A, before delivering the same to the purchaser, causing an entry to be made in a book kept for that purpose, stating the date of sale, the name and address of the purchaser, the name and quantity of the poison sold, the purpose for which it is represented by the purchaser to be required, and the name of the dispenser; such book to be always open for inspection by the proper authorities, and to be preserved for reference for at least five years. The provisions of this section shall not apply to the dispensing of poisons, in not unusual quantities or doses, upon the prescriptions of practitioners of medicine.

SEC. 8. Nothing contained in the foregoing sections shall apply to or interfere with the business of any practitioner of medicine who does not keep open shop for the retailing of medicines and poisons; nor with the business of wholesale dealers, excepting section seven and the penalties for its violation.

SEC. 9. Any person who shall attempt to procure registration for himself, or for any other person under this act, by making or causing to be made any false representation, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be liable to a penalty not exceeding five hundred dollars. Any registered pharmacist who shall permit the compounding and dispensing of prescriptions of medical practitioners in his store or place of business by any person or persons not registered, except under the *immediate* supervision of a registered pharmacist, or *registered assistant pharmacist*, or any person not registered who shall keep open shop for the retailing or dispensing of medicines and poisons, or any person not registered who sells, compounds or dispenses drugs, medicines or poisons, or prepares physicians' prescriptions, except under the *immediate supervision of a registered pharmacist*, or any person who shall fraudulently represent himself to be registered, or any registered pharmacist or dealer in medicine who shall fail to comply with the regulations and provisions of this act, in relation to retailing and dispensing of poisons, shall, for every offense, be deemed guilty of a misdemeanor, and, upon conviction thereof, be liable to a penalty not exceeding five hundred dollars.

SEC. 10. All previous acts and parts of acts, applying to the County of Kings, relating

to the practice of pharmacy and the sale of poisons, and conflicting with the provisions of this act, are hereby repealed.

SEC. 11. It shall be the duty of the district attorney of the County of Kings, upon information of the Board of Pharmacy herein created, to prosecute any and all violations of this act.

SEC. 12. Each and every penalty recovered under this act shall be paid to the Treasurer of the Kings County Pharmaceutical Society, for the benefit of the Society.

SEC. 13. This act shall take effect immediately.

PHARMACY LAW OF VIRGINIA.

CHAPTER 476.

AN ACT TO INCORPORATE THE VIRGINIA PHARMACEUTICAL ASSOCIATION, AND TO REGULATE THE PRACTICE OF PHARMACY, AND TO GUARD THE SALE OF POISONS IN THE STATE OF VIRGINIA.

Approved March 3, 1886.

1. Be it enacted by the General Assembly of Virginia, That G. W. May, T. Roberts Baker, Jno. W. Pierce, Charles A. Santos, James E. Scott, F. H. Massey, J. W. Thomas, Jr., O. F. Mingea, C. H. Lumsden, George C. Starke, W. T. Spotswood, E. R. Beckwith, W. E. French, R. W. Thompson, S. W. Snyder, C. L. Wright, J. S. Bingley, T. F. Knock, Jno. A. Wells, J. P. Banks, Joseph Carr, J. R. Belcher, J. V. A. Tucker, W. J. Carter, C. B. Fleet, E. C. Hamner, W. M. Seward, W. A. Strother, J. W. Faulkner, E. A. Craighill, Robert F. Latham, F. C. Blencowe, Jesse Child, John T. Bishop, William P. Bell, C. P. Kerfoot, W. S. Purcell, C. J. Noel, M. Griffith, William Auman, Luther Ott, James L. Avis and Polk Miller, and such other persons as may be associated with them under the provisions of this act, be and the same are hereby made a body corporate, under the name and style of The Virginia Pharmaceutical Association, and by said name shall have the right to sue and be sued, to plead and be impleaded, to purchase and hold real estate, and grant the same, to have and to use a common seal, and to do such other things, and to perform such other acts, as appertain to bodies corporate and politic, not inconsistent with the constitution and laws of the state; provided, said association shall not hold, at any one time, real estate in excess of ten thousand dollars in value.

SEC. 2. The object of said association is to unite the pharmacists and druggists of this state for mutual aid, encouragement and improvement, to encourage scientific research, develop pharmaceutical talent, to elevate the standard of professional thought, and ultimately restrict the practice of pharmacy to qualified pharmacists and druggists.

SEC. 3. That from and after the passage of this act, it shall not be lawful for any person other than a registered pharmacist or practicing physician, to retail, compound or dispense medicines or poisons, or to open or conduct any pharmacy or store for retailing, dispensing or compounding drugs or medicines, unless such person shall be or shall employ and place in charge of said pharmacy or store a registered pharmacist, within the meaning of this act; *Provided*, That nothing herein contained shall prevent the sale by merchants of quinine, epsom salts, castor oil, essence of peppermint and other flavoring preparations, calomel, camphor, iodide, bromide and chlorate of potassa, opium, paregoric and sweet oil, and such other domestic and proprietary remedies as are usually kept by retail dealers; but the sale of laudanum, morphine and proprietary medicines must be in original packages, as obtained from druggists.

SEC. 4. Any person, in order to be registered, shall be a graduate of some college of pharmacy recognized by the Virginia Pharmaceutical Association, or shall, at the passage of this act, have had three years' experience in drug stores where the prescriptions of

medical practitioners are compounded, or shall be a licentiate of pharmacy of the Board of Pharmacy of Virginia.

SEC. 5. This association shall elect ten of its members, from whom the Governor shall select five, who shall constitute the Board of Pharmacy of the State of Virginia, and shall hold office for the term of one, two, three, four and five years, respectively, as herein provided, and until their successors have been duly appointed and qualified. The Virginia Pharmaceutical Association shall annually thereafter recommend five pharmacists, from which number the Governor shall fill the vacancy, annually occurring in said Board. In case of death, resignation or removal from the state of any member of said Board, the Governor shall appoint in his place a pharmacist from the names last submitted to him, to serve as a member of the Board for the remainder of the term. The Board is empowered to transact all business relating to the legal practice of pharmacy; to examine into and adjudicate upon all cases of abuse, fraud, adulteration, substitution or malpractice, and to enforce all the provisions of the law, and to report all violations of this act to the proper state authorities and to the association, whenever the same may occur. Any one examined by the Board shall pay a fee of five dollars. In case of failure to pass a satisfactory examination, he shall be granted a second examination without the payment of a further fee. It shall be the duty of the members of the Board, after receipt of notification of their appointment, to appear before the clerk of the city or county court, or any other person authorized to administer an oath, in which they individually reside, and make and subscribe to an oath properly and faithfully to discharge the duties of this office, and within thirty days thereafter meet and organize, by the election of president and secretary of the Board. The secretary shall be elected to serve for the term of five years, and the term of office of the other members shall be determined by lot. The Board shall hold meetings at least once annually, or oftener, as the business of the Board may require. The secretary shall give each member of the Board not less than ten days' notice of each meeting. Three members shall constitute a quorum. It shall be the duty of the Board to examine all persons applying for examination in proper form, and to register such as shall establish their right to registration in accordance with the provisions of this act.

SEC. 6. Pharmacists, claiming the rights of registration under this act on account of practical experience, shall, within ninety days after its passage, or after the organization of the Board, show to the satisfaction of the Board of Pharmacy to be created by this act, that they have had not less than three years' practical experience in the preparation of physicians' prescriptions, and in compounding and vending medicines and poisons; provided nothing in this section shall apply to any person or persons in business on their own account upon the passage of this act. Licentiates in pharmacy must have had not less than three years' experience previous to the passage of this act, in stores where prescriptions of medical practitioners have been prepared, or shall have passed an examination before the Board of Pharmacy of the state; and in all cases two years of experience shall be required. The Board may register, without further examination, the licentiates of such other Boards of Pharmacy as they may deem proper.

SEC. 7. It shall be the duty of the secretary of the Board of Pharmacy to keep a book of registration at some convenient place, of which due notice shall be given through the public press, in which shall be entered, under the supervision of the Board, the names and places of business of all persons coming under the provisions of this act, and a statement, to be signed by the person making the application, of such facts in the case as he may claim to justify his application. The fee for registration of proprietors shall not exceed two dollars, and for those in the employ of others shall not exceed one dollar. The secretary shall give receipts for all moneys received by him, which moneys shall be used for the purpose of defraying the expenses of the Board of Pharmacy, and any surplus

shall be for the benefit of the association. The salary of the secretary shall be fixed by the Board, and shall be paid out of the fees for examination and registration. Each member of the Board of Pharmacy shall receive the sum of five dollars for every day engaged in the service of the Board, and such actual expenses as may be incurred in going to and from the place of meeting. It shall be the duty of the Board, or any member of the association, to report all complaints of disregard or non-compliance with or violations of the provisions of this act, to the proper prosecuting officers of the commonwealth, and to the association; and it shall be the duty of such officer to prosecute the same when brought to his attention, and there appears to be reasonable ground for such complaints. The Board is hereby empowered to make such rules and regulations as it shall find necessary for carrying into effect the provisions of this law, not inconsistent with the purpose and spirit of the same.

SEC. 8. Every person, from and after the passage of this act, shall be held responsible for the quality of all drugs, chemicals and medicines he may lawfully sell or dispense, with the exception of those sold in the original packages of the manufacturers, or taken from original packages, and also those known as patent medicines, and the essences of lemon, peppermint and cinnamon, put up for sale for flavoring purposes; and should he intentionally adulterate, or cause to be adulterated, or expose to sale, knowing the same to be adulterated, such drugs, chemicals or medicinal preparations, he shall be deemed guilty of a misdemeanor; and, upon conviction thereof, be liable to a penalty of not exceeding one hundred dollars, and in addition thereto, if he be a registered pharmacist, his name may be stricken from the register. Every registered pharmacist, who desires to continue the practice of his profession, shall annually thereafter, within thirty days next preceding the annual meeting of the Board of Pharmacy, pay to the secretary of the said Board a registration fee of one dollar, for which he shall receive a renewal of said certificate of registration. Any registered pharmacist failing to renew his registration, as required by this section, and continuing in the exercise of his profession, shall be guilty of a misdemeanor, and, upon conviction thereof, punished by fine not exceeding twenty-five dollars for each offence.

SEC. 9. It shall not be lawful for any person, who has authority to sell or dispense medicines or poisons, under a penalty of twenty five dollars for each and every offence, from and after the passage of this act, except as provided herein, to retail any poisons enumerated in Schedules A and B, as follows, to wit:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, white precipitate, biniodine of mercury, cyanide of potassium, hydrocyanic acid, strychnine, and essential oil of bitter almonds.

SCHEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitalis, and their pharmaceutical preparations; croton oil, chloroform, chloral hydrate, sulphate of zinc, carbolic acid, oxalic acid, preparations containing opium, except paregoric and other preparations of opium containing less than two grains to the ounce, and other deadly poisons, without distinctly labeling the bottle, box, vessel or paper in which said poison is contained, with the name of the article, the word poison, and the name and place of business of the seller; nor shall it be lawful for any person to sell or deliver any poison enumerated in said Schedules A and B, unless upon due inquiry it be found that the purchaser is aware of its poisonous nature, and represents that it is to be used for a legitimate purpose; nor shall it be lawful for any person to sell any poison in Schedule A, without, before delivering the same to the purchaser, causing an entry to be made in a book kept for the purpose, stating the date of

the sale, the name and address of the purchaser, the name and quantity of the poison sold, the purpose for which it is represented by the purchaser to be required, and the name of the dispenser; such book to be always open to public inspection. The provisions of this section shall not apply to the dispensing of poisons in usual doses on physicians' prescriptions, put up by registered pharmacist, or dispensed by the physician.

SEC. 10. Nothing contained in the foregoing section shall apply to or interfere with the business of any practitioner of medicine who does not keep open shop for the retailing of medicines and poisons, nor with the business of wholesale dealers, excepting section nine, and the penalties for its violation.

SEC. 11. If any person who shall permit, by wilful neglect, the compounding and dispensing of prescriptions in his store or place of business by any person or persons not registered, except under the immediate supervision or control of a registered pharmacist; or any person not registered, who shall keep open shop for the retailing or dispensing of medicines or poisons, except as hereinbefore provided, or who shall fraudulently represent himself to be registered, or any registered pharmacist, or any dealer in medicine, who shall fail to comply with the regulations and provisions of this act in relation to retailing and dispensing of poisons, shall, for every such offence, be deemed guilty of a misdemeanor, and, upon conviction thereof, be liable to a penalty not exceeding twenty-five dollars.

SEC. 12. Any pharmacist failing to comply with the requirements of sections six and eight, within ninety days from and after the passage of this act or organization of the Board, shall forfeit his right to registration, and shall appear before the Board of Pharmacy for examination, as provided in this act.

SEC. 13. Registered pharmacists, under the provisions of this act, are hereby relieved from serving on juries.

SEC. 14. This act shall be in force from its passage.

LAWS ON MORPHINE LABELS.

A. FLORIDA MORPHINE LABEL LAW.

Not received.

B. GEORGIA MORPHINE LABEL LAW.

(REGULATING THE SALE OF MORPHINE.)

SECTION 1. *Be it enacted by the General Assembly of the State of Georgia,* That on and after the first day of January, 1886, it shall not be lawful for any druggist, or other dealer in drugs and medicines, to sell or offer for sale any sulphate or other preparation of morphine in any bottle, vial, envelope or other package, unless the same be wrapped in a scarlet paper or envelope, and all bottles or vials used for the above purpose shall have in addition to the said scarlet paper wrapper, a scarlet label, lettered in white letters, plainly naming the contents of the said bottle.

SEC. 2. *Be it further enacted by the authority aforesaid,* That any one violating the provisions of the above section shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten nor more than fifty dollars, at the discretion of the Court, for each and every violation of the preceding section.

SEC. 3. *Be it further enacted,* That all laws and parts of laws in conflict with this Act be, and the same are hereby repealed.

Approved Oct. 13, 1885.

C. KENTUCKY MORPHINE LABEL LAW.

SECTION 1. *Be it enacted by the General Assembly of the Commonwealth of Kentucky:* That on and after September 1, 1886, it shall not be lawful for any druggist, or other dealer in drugs and medicines, to sell or offer for sale any sulphate or other preparations of opium [morphine] in any bottle, vial, envelope, or other package, unless the same shall be wrapped in a scarlet paper or envelope, and all bottles or vials used for the above purpose shall have, in addition to said scarlet wrapper, a scarlet label, lettered in white letters, plainly naming the contents of said bottle, and having the word poison and the skull and cross-bones marked thereon.

SEC. 2. That any one violating the provisions of the above section shall be guilty of a misdemeanor, and, on conviction thereof, shall be fined not less than \$10 nor more than \$50, at the discretion of the court or jury, for each and every violation of the preceding section.

SEC. 3. That all laws and parts of laws in conflict with this act be, and the same are hereby repealed.

D. NEW YORK MORPHINE LABEL LAW.

AN ACT TO AMEND SECTION FOUR HUNDRED AND FOUR OF THE PENAL CODE.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section four hundred and four, of the Penal Code, is hereby amended so as to read as follows:

SEC. 404. A person who sells, gives away, or disposes of any poison or poisonous substance (except under the order or prescription of a regularly authorized practicing physician) without attaching to the vial, box or parcel containing such poisonous substance, a label with the name and residence of such person, the word "poison" and the name of such poison, all written or printed thereon in plain and legible characters; *and a person who, after the first day of January, 1887, sells, gives away or disposes of or offers for sale any sulphate or other preparation of opium or morphine, except paregoric and those preparations containing two grains or less of opium or morphine to the ounce, without attaching to the bottle, vial, box or package containing such sulphate or other preparation of opium or morphine, a scarlet label lettered in white letters, plainly naming the contents thereof, with the name and residence of such person,* is guilty of a misdemeanor.

SEC. 2. This act shall take effect immediately.

E. OHIO MORPHINE LABEL LAW.

AN ACT TO PRESCRIBE THE MANNER OF SELLING THE SULPHATE AND OTHER PREPARATIONS OF MORPHINE IN THIS STATE, AND FOR OTHER PURPOSES.

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio,* That it shall not be lawful for any person, other than a wholesale druggist or other dealer in drugs and medicine, to sell or offer for sale at wholesale, or for any person other than a registered pharmacist or a registered assistant pharmacist to sell or offer for sale at retail, morphine or any of its salts, in this State, and it shall not be lawful for such persons to sell or offer for sale morphine or any of its salts in any bottle, vial, envelope or other package, unless the same shall be wrapped in a scarlet paper or envelope, and all bottles or vials used for the above purpose shall contain not more than one drachm each, and shall have in addition to said scarlet wrapper, a scarlet label lettered in white letters, and the same must be upon both vial and wrapper when vials are used, plainly naming the contents of said bottle; and further, that no person shall have the right to change any

preparation of morphine from its original package to any other receptacle whatever for the purpose of retailing or dispensing therefrom, but it must be retailed or dispensed only from the original package with scarlet wrapper and scarlet label aforesaid.

SEC. 2. That any one violating the provisions of the above section shall be guilty of a misdemeanor, and on conviction thereof, shall be fined not less than ten nor more than fifty dollars, at the discretion of the Court, for each and every violation of the preceding section.

SEC. 3. That all laws and parts of laws in conflict with this act be and the same are hereby repealed.

SEC. 4. This act shall take effect and be in force from and after September 1, 1886.

JOHN C. ENTREKIN,
Speaker of the House of Representatives.

JNO. O'NEILL,
President pro tem. of the Senate.

Passed April 8, 1886.

F. VIRGINIA MORPHINE LABEL LAW.

CHAP. 433.—AN ACT TO PROVIDE THE MANNER OF SELLING THE SULPHATE AND OTHER PREPARATIONS OF MORPHINE IN THE STATE OF VIRGINIA.

(Approved March 1, 1886.)

SECTION 1. *Be it enacted by the General Assembly of Virginia*, That on and after the first day of July, eighteen hundred and eighty-six, it shall not be lawful for any druggist or other dealer in drugs and medicines to sell, or offer for sale, any sulphate or other preparation of morphine, in any bottle, vial, envelope or other package, unless same shall be wrapped in a scarlet paper or envelope; and all bottles and vials used for the above purpose shall have, in addition to said scarlet wrapper, a scarlet label, lettered in white letters, plainly naming the contents of said bottle or package.

SEC. 2. That any person violating the provisions of this act shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten nor more than fifty dollars, at the discretion of the jury, for each and every violation of the same.

SEC. 3. All acts or parts of acts in conflict with this act, are hereby repealed.

SPECIAL REPORTS AND ESSAYS

I. PHARMACY.

ON THE PURITY OF MEDICINAL SUBSTANCES.*

BY J. M. GOOD, ST. LOUIS.

QUERY NO. 89.—*What should be the relation between wholesale druggists, manufacturing chemists and pharmacists and dispensing chemists, as to the maintenance of proper standards of purity, quality and strength of medicinal substances?*

The query offers opportunities for a lengthy essay, inasmuch as the relations of these two classes to each other involve the discussion of ethics as well as of business principles, but yet it may be answered by quoting the golden rule and leaving the rest to the law of supply and demand. "The maintenance of proper standards of purity, quality and strength of medicinal substances" is much to be desired, and the co-operation of all concerned is essential to any sort of success. Care and exactness on the part of the dispenser; a *demand* from him for *better drugs*, or of the *best obtainable*, will always be met. The more nearly general his demand becomes, the higher will the standard of purity be raised, and for jobbers to furnish the best will be the rule instead of the exception.

Mr. Stearns, when in "London, the centre of the world's drug-market" asked the question, "Where do the best drugs go?" He was answered: "To France—the French pharmacist wants the best of everything; the next best goes to America." The Frenchman gets what he wants; apparently also does the American. Supply follows demand.

The temptation on the part of the manufacturers to adulterate is resisted only when met by a strong inherent moral force. That the practice is uncomfortably common is shown in the use of flour and terra alba in candy, wax and spermaceti in menthol cones, calcium tartrate in cream of tartar, cinchonidine, salicin or hygroscopic water in quinine, and so on through a long list that might be mentioned; and the dishonesty of dealers or middle men finds exemplification in the very general adulteration of spices and articles of food, or in concealing in the mass of opium

* Presented at the Fifth Session.

such heavy materials as stones, lead or iron. Vigilance on the part of the retailer, encouraged by the co-operation of the manufacturer or jobber, is the only remedy. The latter will certainly be influenced by intelligent criticism, and a check will be placed upon carelessness or dishonesty if dispensers form the habit of frequently and carefully inspecting and testing their purchases. The following quotation, taken from a recent report, seems apt:

“The object for which the committee exists should be to improve the class of goods purchased in open market by pharmacists, and not to punish by exposure those who by carelessness, accident or design, falsify such goods. If they had this power, and it was understood by manufacturers and wholesale dealers that what is done is for our mutual good, all honest men among them would seek to encourage the work and render every aid in their power for its prosecution, instead of, as now, being afraid of some overlooked mistake going forth to injure their reputation.”

A recent popular article by Dr. A. B. Lyons on Pharmaceutical Assaying, shows what may be done by intelligent, industrious druggists; yet the disability or disinclination on the part of many will probably long continue as a source of regret to others.

Our wholesale druggists as a class are men of intelligence, enterprise and wealth; they can be relied upon to throw the weight of their influence on the side of honesty in the handling of drugs and chemicals; if the class of retail druggists, who have, combined, the time, inclination and ability to assay their drugs is small, the number who would like to have it done for them is very large. Here is an important and valuable opportunity, then, for the firm who would employ an expert to frequently test the purity of chemicals, and to determine by inspection or assay the value of *all the drugs* they sell.

Such a person must be at once a chemist and an accomplished pharmacist, and he should be willing to risk his reputation when he affixes his stamp of strength or purity to any article. Dr. E. R. Squibb may be mentioned as a conspicuous example in this connection.

A large business would go to that establishment wherein there was the same evidence of care and skill, accompanied with the enterprising methods for which our jobbers are particularly noted.

The habit of purchasing chemicals and powdered drugs *in bulk* is one which is open to serious objection because of the opportunities offered for substitution or adulteration.

Recently we have reports of the adulteration by jobbers of calomel and red precipitate purchased in bulk.

What Dr. Squibb says about containers is food for reflection; in fact, his attitude toward his customers generally is both refreshing and instructive. Members will pardon personal allusion when so noble and conspicuous an example presents itself.

Toward furthering the common good suggested by the query, gatherings composed of representative men from both branches of the business would have a beneficial influence. We are stimulated by the presence of others, and numbers have their effect. We have always accorded a hearty welcome to the delegates from the National Wholesale Druggists' Association, and with equal cordiality we have been received by them. These delegations should be larger.

Education will also be an important factor in this matter. When men have general as well as special information, they as a rule have broader views, and treat their fellow-men with justice and liberality. The jealous and suspicious druggists are the untutored. They have the four walls of a little shop for a horizon, and their greatest mental strain is retailing neighborhood gossip.

ON LOSS OF ALCOHOL.*

BY JOSEPH FEIL, PH. G., CLEVELAND, O.

QUERY NO. 119.—*What amount of alcohol is lost in the various methods of recovering it from the dregs of tinctures and fluid extracts?*

Operating on about eight thousand pounds of a great variety of drugs, with menstruums ranging in alcoholic strength from twenty per cent. to U. S. P. alcohol, and exhausting the dregs in a variety of sectional percolators holding about five hundred pounds, distilling the weak percolate and re-distilling after an addition of potassium permanganate, the loss was about ten per cent. (exactly 9.8 per cent.) The quantities of drug operated on at a time ranged from five to fifty pounds.

With better facilities, and operating on a very large scale, I believe the loss would not exceed seven to eight per cent. On a small scale, conducting percolation as we find it in the average pharmacy, and the amount of drug ranging from one to five pounds, the loss of alcohol must average twenty-five per cent. or even more.

The first distillation always possessed a peculiar odor, which seemed to be the same no matter what the dregs represented it had been recovered from. I have noticed the same odor also in the first distillate of alcohol from dregs in other laboratories.

* Presented at the Fifth Session.

REJOINDER TO “REPLY TO CRITICISMS.”*

BY H. T. CUMMINGS, M. D., PORTLAND, MAINE.

Our attempt at a solution of Mr. Rosenwasser's paper seems to have created a lively effervescence, attended by its usual concomitant, the liberation of a notable volume of gas. We do not regard his analysis as a success. We have carefully re-examined our solution, and cannot discover any precipitate, or even a trace of turbidity therein, produced by his HCl or H₂S. Mr. R. must try another reagent.

We were somewhat amused to find him slipping up once more in his physics, in commenting upon what he seems to deem a piece of misinformation we quoted from Mr. Berry. Mr. Berry informs us that he gave rather a general estimate than one founded on accurate calculation, and we accepted it without further question, knowing that the aggregate pressure on the diaphragm under the conditions existing in the percolator is directly proportional to the squares of the diameter of the tube and diaphragm. This same law holds good in the hydraulic press. Since then we have made some calculations, and find that a column of water at 60°F. contained in an open tube of $\frac{1}{16}$ inch calibre and 8 ft in length presses with a force of 4.254 ounces avoirdupois upon its base. When this pressure is brought to bear upon the percolator of seven inches diameter already filled with water, the aggregate pressure upon the area of the diaphragm equals 478 times the simple pressure of the column. This aggregate pressure amounts to 134.66 pounds avoirdupois; which, if Mr. R. should undertake to lift, he would find it no trifling bagatelle. And when to this is added the weight of the menstruum in the reservoir the pressure will be proportionably increased—not merely by the additional four or five inches more or less to the length of the column, but by a large proportion of the weight of the menstruum, be it a pint or a gallon. We wonder if Mr. R. has never heard of that ancient experiment of bursting a wine cask by producing precisely similar conditions to those existing in his percolator, excepting that the water in the cask had no way of escape but by forcing out the bung or bursting the hoops.

As to the indictment of “abuse” we plead “not guilty.” We thought Mr. R. deserving of censure for his tirade against the Revising Committee, though whether it was competent in us to administer it may be an open question. We hope to be pardoned for a mild surprise that an excellent committee of publication allowed Mr. Rosenwasser's abuse to slip by them, while they expurgated all the fun out of our paper for fear of personalities.† It rather suggested, by a very distant association of ideas, Lowell's couplet,—

* Presented at the Fifth Session.

† The Publishing Committee expunged from Dr. Cummings' “Review and Critique,”

"You'd left out a comma, your Greek's put in joint
And pointed, at cost of your story's whole point."

We shall not occupy the time of the Association any further in this discussion. If Mr. Rosenwasser wishes for the last word, he is welcome to it.

EVAPORATION OF PERCOLATES.*

BY J. U. LLOYD.

In a series of papers preceding this one I have referred to certain conditions that influence favorably or unfavorably the act of percolation. Passing now to the percolate, which we usually have to concentrate in whole or in part by evaporation in making the various pharmaceutical preparations, I will introduce a subject that we also must take into consideration, in order to produce uniform results at different times and when working varying quantities.

In making fluid extracts and many other preparations, we have to evaporate reserved percolates, or entire percolates. It is generally accepted that a protracted application of heat to liquid preparations of vegetable origin is to be avoided, and in many instances it is certainly necessary to employ but little and often to avoid any heat. In this paper I shall not consider the effect of the use of heat in individual percolates, but shall call attention to a feature of general application, and which is scarcely, if at all, considered by pharmacists. It involves the preparation of many substances, and may prove of interest to Pharmacists who have overlooked this phase of the subject.

In making the officinal amounts of fluid extracts we usually have varying, but small bulks of percolates to concentrate to a certain amount. Many of us have reason to increase the officinal quantities, and perhaps few pharmacists conform literally to the amount of drug specified in the Pharmacopœia. The problem I bring forward is, can an increase or decrease of the amount of material cause a variation in the product, provided the proportions of all substances are maintained? For the sake of argument, we will admit that in all operations the act of percolation is complete and uniform.

That an increase of proportions may make a difference in the products is evident to all who have reason to increase amounts from time to time. Often many times the original formula is employed, and that such an in-

in 1884, and from Mr. Rosenwasser's "Answers to Criticisms," in 1885, all direct personalities. By still closer pruning, both papers would have probably been even more acceptable to most members.—EDITOR.

* Read at the Fifth Session.

crease will make a variation in the quality of the evaporated product, from the application of excessive heat alone, can I think be conclusively demonstrated: I will take as an example, a substance in which the variation can be made apparent to the eye.

If fifteen fluid ounces of vinegar of squill be evaporated to one fluid ounce, does it follow that this product is identical with like amounts of the product that results from the evaporation of thirty fluid ounces to two fluid ounces, the same temperature being maintained in each instance?—Continuing, will the resultant liquid remain uniform, when batch after batch is doubled, provided that the product is also each time doubled thus maintaining the proportion? In reply I submit as samples in vials of uniform diameter:

No 1. From $7\frac{1}{2}$ fluid ounces of vinegar of squill evaporated to $\frac{1}{2}$ fluid ounce.

No 2. From 15 fluid ounces, evaporated to 1 fluid ounce.

No 3. From 30 fluid ounces, evaporated to 2 fluid ounces.

No 4. From 60 fluid ounces, evaporated to 4 fluid ounces.

No 5. From 120 fluid ounces, evaporated to 8 fluid ounces.

The evaporation was conducted in porcelain dishes of the usual dimensions. The temperature varied but little from 175° F. to 180° F.

It will be seen that the specimen that I submit, representing the smallest amount of drug, is a light amber color, but darker than the vinegar of squill used in making it, and that each successive batch increases in color with the increase of material, until a dark brown red is produced. It will also be found that the odor varies from a pleasant dilute acetic acid in the small amount, to that of a burnt cracker in the larger, and it is also true that the flavor of successive batches becomes more foreign to prime squill as there is an increase of material worked. Thus it is evident that there is a variation in product with each increase of batch, even though in all instances the same formula is followed—for, in all these experiments, filtered vinegar of squill from one batch was employed. In explanation of the apparent inconsistency, a little thought will show us that the conditions were changed in each experiment, although the same process was followed, and, that no two batches were submitted to the same application of heat.

	Time required for evapora- tion.	Capacity of dish.	Surface of liquid before evaporation.	Surface of liquid after evaporation.
No. 1 . . .	160 minutes .	12 ounces.	5 inches diameter	$3\frac{1}{4}$ inches diameter.
No. 2 . . .	180 minutes .	32 ounces.	$6\frac{3}{4}$ inches diameter .	$3\frac{1}{2}$ inches diameter.
No. 3 . . .	400 minutes .	32 ounces.	$7\frac{1}{2}$ inches diameter .	5 inches diameter.
No. 4 . . .	470 minutes .	128 ounces.	$9\frac{1}{2}$ inches diameter .	6 inches diameter.
No. 3 . . .	745 minutes .	128 ounces.	$11\frac{1}{2}$ inches diameter .	$7\frac{1}{2}$ inches diameter.

The increase of evaporating surface in the usual evaporating basins, as we pass to larger dimensions, is not sufficient to produce a uniform product when proportions are increased accordingly. Therefore, it follows that with the substances injured by a continued application of heat, we must take into consideration the fact, for it is undeniable, that a conformity to the officinal process may be only apparent and not practical. I have selected as an illustration, a substance in which a change produced by heat is perceptible to the eye. It is not more clearly defined, however, than is the case in many other bodies that have come under my consideration, where I have been forced to increase batches, often to a thousand pounds or more, and I am not as enthusiastic as some persons are, regarding the injury following the application of a moderate heat to the majority of products from dried plants. There is no doubt, however, that in many cases a continued application of heat (simply from an increase of quantity, and where the operator really thinks he will make a substance to conform with the pharmacopœial requirements) may result in a product that in many respects would be entirely different from that made if the officinal amounts were followed. The application of this rule is general, and, when the conditions of the apparatus are similar, favors the pharmacist who follows the U. S. P. amount, rather than the manufacturer who uses the U. S. P. process, and applies it to large quantities. Doubtless, all of us have been confronted with this problem, by an observance of the change following the variation in batches, but perhaps we passed it by as unimportant, or argued that a like process must produce like results. Many arrangements have been advanced as to the advantages or disadvantages of operators on a large or small scale, but as yet I have to find the first claim by the pharmacist who works in Pharmacopœial amounts of the advantage he has, as introduced in this paper.

The color of fluid extract of squill may "range from light amber to dark brown red in accordance with conditions of the evaporation"—the larger the amount the more objectionable the product. By the usual methods of evaporation that formula is only applicable to small amounts, and cannot be employed in making large batches.

CONCENTRATED LIQUID PREPARATIONS FOR DILUTION. *

BY JOSEPH L. LEMBERGER, LEBANON, PA.

QUERY NO. 100.—*Is it not feasible to prepare concentrated liquid preparations from many drugs, which need only be diluted with the appropriate menstruum to bring them to the officinal strength, without having them differ*

*Read at the Fifth Session.

in any important point from the weaker preparations directed by the U. S. Pharmacopœia?

This subject has been accepted with a full knowledge that there is more or less prejudice against the use of concentrated preparations, the dilution of which shall represent the weaker preparation of the Pharmacopœia; such prejudice or opposition, as far as I can ascertain, is based not so much upon the impracticability of the plan, as upon the lack of pharmaceutical integrity in the preparation of the concentrated preparation; and in the writer's judgment, this thought might form a topic for investigation of equal importance to the query as presented. Numerous trials made not in the way of modifying the Pharmacopœia formulæ at all, but rather to accomodate demand coming from a certain class of patrons, I find that from an honestly prepared fluid extract, for example the fluid extract of ergot, aconite root, or nux vomica, a wine or tincture can be prepared answering in all respects to, and filling the requirements of, the officinal tinctures. It is true that the same therapeutic result will in most instances be attained by administering either one of the named preparations in a corresponding smaller dose, yet in the use of say tincture of aconite or any other of the powerful preparations sometimes used for outward application in liniments or washes, there can in our judgment no deterioration occur by such dilution; it has been frequently tried with fluid extracts of known purity and of careful home manufacture. The writer has a physician patron who, in ordering the wine of ergot stipulates that he *wants* it made with the fluid extract as of old, although it is no longer the officinal process for its manufacture.

Infusions may be more readily made with a concentrated preparation, and are unquestionably quite as good therapeutically as those made by the required process of maceration for one or more hours. The writer has been in the habit of thus making the compound infusion of gentian, and although it is not an officinal preparation at this time, it was formerly, is frequently prescribed now, and should have been kept in the Pharmacopœia. In my judgment a concentrated preparation such as one to which reference is made in the last dispensatory, W., R. and S. page 795, is not only justifiable, but in every way practical and feasible.

Some pharmacists having country physicians' trade are frequently called upon for an infusion of gentian, or perhaps digitalis or quassia, and it is wanted in less time than the officinal process will allow it to be made, and with the physicians' consent I have on numerous occasions accommodated such want by making from the fluid extract in the required proportion.

In answer then to Query No. 100, it is my judgment that it is quite feasible to prepare concentrated liquid preparations of some drugs which may be diluted so as to bring to the officinal strength. They might have to be specifically designated, say "Concentrated liquor of gentian for infusion," etc., and care would have to be taken in the proper adjustment of the menstruum.

GINGER IN "SOLUBLE ESSENCE."*

BY LUTHER F. STEVENS, BROOKLYN.

The published accounts of the work done by Mr. Thresh, of London, in his studies upon ginger, proved exceedingly attractive to the present writer, and one dull afternoon some years ago, while running through that gentleman's experiments, the thought would obtrude itself upon the brain "that if in the second stage of his operation 'lime or magnesia' was disadvantageous, perhaps it might be also in the first," although he there uses it to throw down the resins. This idea led on to a further query, "Why should not water alone be a sufficient precipitant?" Thence followed trials and detailed experiments which eventuated in the proof to the writer's mind that it was possible to easily produce by a simple process a truly *soluble essence of ginger*, readily miscible with any ordinary diluent, and yet representing all the grateful portions and the real therapeutic values of *tinctura zingiberis*, Ph. 1870, and greater than the tincture of 1880, in the *same doses*, and at a less prime cost.

Mr. S. A. D. Sheppard, who has contributed much to the history of ginger, in answer to a query, before the Massachusetts State Pharmaceutical Association, June, 1885 (Ph. Record, June 15, 1885), recites the successive attempts at a "soluble" essence—stating there

B. Proctor's (of England) on the alum process, where the resins are partly precipitated, partly broken up by sulphate of alumina ;

Creuse's, or the magnesia plan (also at first adopted by Thresh without credit to Creuse), where the concentrated alcoholic tincture is treated with magnesium oxide, filtered, and then evaporated to increase the strength ;

Carl Riebe's process, or the scrap filter paper method, getting rid of the alcohol by evaporation at a *very low* temperature, and then dissolving as much as possible of the remainder in aqueous medium ;

Also, Thresh's later process of precipitating all resins by air-hydrated lime, freeing from lime by an acid, and then clearing and fining the product.

Another method still, and one used by some manufacturers of bottlers' supplies, is simply to saponify the resins in the usual way by means of a strong alkali.

None of these are exactly satisfactory. Some attempt too much ; some are deficient in aroma ; some if still *hot* are open also to the objection of a soapy chemical taste and smell.

So brother Sheppard concluded, and correctly, that owing to the peculiar constituents of ginger, no preparations from it could be made which would mix readily with aqueous menstrua and still accurately represent the drug.

* Read at the Fifth Session.

To Mr. Thresh is due the great credit of the discovery of *gingerol*, which had been suspected by Prof. Buchheim during his experiments in 1873, but has not up to the present time, so far as I can find from any publication, been isolated. The oils and resin had been well known since the study put upon the article by our own Procter, when he devised a fluid extract.

Thresh finds in ginger :

A hot pungent resin, A.
 A secondary, more inert resin, B.
 An active principle gingerol.
 A volatile oil a heavy oil.
 Wax, fat, gum, coloring matters, etc.

We wish to save nearly all of these except the first hot resin.

Therefore into a half gallon bottle put the following :

R. Fluid ext. ginger Oj.
 Powdered pumice stone 4 oz. avdp.
 Water Oij.
 M. secundum artem.

Pour the fluid extract into the bottle and add to it the pumice, shake well occasionally during several hours, and then slowly add the water in portions of about 4 fluid ounces, with plentiful agitation, and alternate periods of rest and subsidence. Continue this at intervals during twenty-four hours. Then filter, and upon the mass in the filter pour water until three pints are obtained, or until the three pints of partly alcohol liquid originally mingled are pushed through, without allowing much water to pass.

If the filtrate thus obtained is not quite clear, it may be shaken with a little pumice, or a very little clean talc; the latter, however, must be used with care, as it is a magnesium compound and may produce a noticeable effect upon the delicate flavor we seek.

The finished product is a delightful representative of the ginger, minus the hot taste. It has the full aroma, and taken internally, is a prompt and rapid diffusible stimulant, without after reaction.

It is of a light straw color (the color varying with different samples of powdered root), darkens slightly upon standing, and by deposit of a little resin becomes in time somewhat cloudy.

The water here does the precipitating, throwing down from the strongly alcoholic solution the dark resin and some of the coloring matters.

The inert separating material prevents the agglutination of the precipitate into flakes and lumps.

The alternate agitation, rest and subsidence, enables the now dilute spirit to dissolve nearly every essential portion except the alpha resin.

Mr. Thresh, in 1882, tried the water and pumice plan, but dumped the whole together at once, and after rapid agitation filtered, when he found so little aroma in the product that he abandoned the plan, missing one of the necessary points in the manipulation, *viz.*, an allowance of time for the exchange of solvent from strong to weak spirit.

Aluminates, any alkali, even the alkaline earths or their carbonates, are detrimental to flavor and aroma. Thresh proved that this was because the two principles, volatile oil and gingerol, are very readily broken up, the latter particularly being super-sensitive to rough treatment. Heat drives off volatile oil. Ether only may be distilled from a solution containing it. Etherial extract of ginger may be freed from the ether, which distills at 98° to 100° F. (37° C.), but shortly after that has passed the oil comes over by itself.

In distilling mixtures of various alcoholic strength, the volatile oil begins to come with the very first portion of spirit at 180° to 185° F. (78° to 80° C.), and continues until the aqueous vapor rises at 211° to 213° , by which time all the volatile oil has escaped from the flask. If the heat is continued up to 220° to 225° F. (104° to 107° C.), the remaining gingerol begins to suffer decomposition; it will even commence to break up by long boiling with water.

Some preliminary points need noting here. The ginger used should be the true "Jamaica," because the volatile oil from that variety is far pleasanter than when obtained from African or Chinese (Cochin ginger), and besides, both the latter kinds have far more of the resins which we seek to eliminate.

The fluid extract should contain no glycerin, is preferable freshly prepared, and should not have been heated in the process of manufacture, because there will have been loss of essential matter.

The powdered pumice as obtained in the market has sometimes a little starchy matter from the mill, and sometimes a portion of impalpable powder, either of which go through the filter, but can be removed by the second shaking, as before spoken of.

Powdered silica may be used in place of pumice.

Kaolin, fuller's earth, or talc, are not advisable.

Endeavors to increase the strength in the finished preparation, that is, to make it represent more than 33% of the soluble portions of the fluid extract, are not economical, as there is loss of gingerol upon the filter, and increasing the alcoholic strength causes more resin to pass through, which afterwards is slowly deposited.

That the powdered "soluble essence" contains volatile oil is proved by distillation, or easily by throwing a teaspoonful upon the surface of hot water in a cup, when it becomes evident to the nose. That it contains the "essence of ginger" or gingerol is proved by physiological test, by swallowing a little, when shortly a genial glow is felt extending throughout the circulation.

The mass remaining upon the filter, if dried and washed with alcohol, yields a solution of hot resin of value for cooking, or for the delectation of “old drunks.” If the alcohol is recovered by distillation, it is found to be sweet, clean and pure, fit for any purpose, which shows that no volatile oil clings to the filter, and the resins will be left behind thick, black and hot, and about 3 fluidrachms of it from 16 troy ounces of Jamaica ginger; this sample shown weighed 177 grains, a little over 2% (think it averages about 2%). Without doubt there will be plenty of use found for it.

The pumice may be regained after the washing, white and ready to be used again—so that this seems to be the Frenchman’s ideal process where nothing is lost.

In the distillation of the alcoholic washings, if the heat is pushed at the last, after the spirit is all off, a pungent smell is noticed for a few moments in the air immediately surrounding the apparatus, but nothing condenses in the Liebig condenser supplied with cold water, showing that a trace of gingerol hangs on to the last. Thresh has found it difficult to entirely free the resin from gingerol.

Of this soluble essence 50 cc. evaporated at a gentle heat in a weighed capsule until weight ceased to be lost, gave a total residue of .21; double this equals .42, or a little less than half of one per cent.

To prove the presence of volatile oil, 50 cc. was distilled until all spirit had passed over and collected in an iced receiver. It has the smell of the oil, is fragrant, but with slight taste. The residue is aqueous, cloudy, aromatic and warm.

To find when the oil comes over most freely, 50. cc. was distilled to dryness, the Liebig condenser iced, and the products received in successive small portions of about 5 cc., in small iced receivers.

Distillation commences with No. 1 at about	185° F.
“ “ “ No. 2 “	200° F.
“ “ “ No. 3 “	203 to 212° F.

Each of these smelled strongly of the volatile oil, the No. 1 much the most so. With No. 3 the spirit had all come over, and with it all the aroma. Successive numbers caught only aqueous matters of little smell or taste, until No. 7, at 213°, which begins to have a peculiar smell, partly pungent of ginger—evidently some of the gingerol and its products in aqueous solution.

This continues up to dryness in Nos. 8 and 9 at 225° F. The residue in the flask dissolves part of it in alcohol, and is pungent and hot to taste, empyreumatic to the smell. Part dissolves only in water and is pungent to the taste, aromatic and tarry to the smell. The first contains some resins, some products of gingerol and some gingerol; the second considerable crude gingerol, some tarry matters soluble in water, but no resin.

From the original fluid extract there was taken 50cc. and distilled in the same manner as above and at same heats, except that about three fluidrachms were received at once in iced homœopathic vials. The spirit all came over smelling of volatile oil, the first the strongest, but no taste developed until No. 4, nearly the last of the spirit, and No. 5 (about 1 fluidrachm), which smells and tastes of the gingerol. No. 6 ($\frac{1}{2}$ fluidrachm) is aqueous, with a drop or two of apparently the terpene, or else a heavy oil. It has little taste, but a strong burnt smell. No 7 (a few drops only) is aqueous with dark colored drops of something which is quite clearly the terpene from the resin. The residues were cleared so much as to produce only decomposition products, creasote and coal. This cursory examination, pharmaceutical in its character and not strictly analytical, seems to prove that this product contains all the volatile oil or aroma, all that is possible by any process of the gingerol or active principle, and a small portion of the flavoring resins, and is minus the hot resin and most of the coloring.

NOTE ON THE USE OF SIMPLE CERATE AS A PILL EXCIPIENT.*

BY GEORGE W. SLOAN, INDIANAPOLIS.

Having used the above with such excellent results in the case of readily decomposable or deliquescent substances, I feel impelled to give my friends the benefit of the same.

Among the articles for which I have used it with success are nitrate of silver, oxide of silver, chloride of gold, chloride of gold and sodium, potassium permanganate, citrate of iron and quinine, chloride of ammonium, and many other salts, especially the bromides of zinc, lithium, etc., in fact such as are frequently prescribed in the pill or capsule form.

The quantity required is small; the mass produced is smooth, plastic, firm, and readily soluble in the stomach; the excipient is always at hand, and if the materials from which it has been prepared are of the best quality and free from moisture, success will be assured.

For articles that are used in small doses, such as the gold and silver salts, I use *talc* as a diluent and as the powder upon the pill machine. I also see that the mortar and pestle are perfectly *dry*, and that a steel spatula is not used with substances that may be reduced, until the mass is thoroughly incorporated with the cerate; then it may be handled exactly as an ordinary pill mass, always remembering that *water*, *glycerin* or *syrup*, will get you into trouble with some of the above mentioned

* Presented at the Fifth Session.

items. The enveloping protection of the fatty matter is the rationale. I am well aware that resin cerate has been suggested, but it has no advantage over the ceratum simplex in any case, and will not serve at all with many substances.

GLYCONIN AND ITS USES.*

BY GEO. C. CLOSE, BROOKLYN.

When, as the result of long and patient research, a new alkaloid or chemical combination is made, there is much excitement among physicians and pharmacists, and they proceed at once to ascertain what its therapeutical properties may be. On the other hand, some person, reasoning from the well known properties of two substances, may be induced to combine them, and may publish the fact that valuable results have ensued; yet very little, if any attention may be paid to his statements, and they may be very soon forgotten.

As an example, Glyconin was first brought to notice by Edmund Sichel, in the "*Bulletin de Thérapeutique*," which notice was copied in the "*Druggists' Circular*" for April, 1868, page 97. Glyconin is composed of four parts by weight of yolk of egg and five parts of glycerin. He directs them to be simply mixed in a mortar. This is not easy to do, but I found that if the yolk of egg was first well beaten with a good egg-beater, it would easily mix with the glycerin.

Mr. Sichel remarks that "When this mixture is applied to the skin, it forms a varnish on the surface, which protects it from the action of the air. This property renders it serviceable for broken surfaces of all kinds, particularly for burns, erysipelas and cutaneous affections, in which it soothes the itching, and for sore nipples; its harmlessness in the latter case prevents any interruption of suckling."

This last clause struck me as being very important, as we all ought to sympathize with women who do their duty by suckling their own offspring, and should always be ready to relieve them from any inconvenience they may suffer from it. I proceeded to make some glyconin, and have always kept it on hand since then. Mothers who used it for sore nipples found it to afford perfect relief, and felt grateful to me for recommending it.

A lady who was afflicted with salt rheum, and at times could not expose her face to the wind without intense suffering, could take long rides in the country without a veil with impunity, if she first covered her face with glyconin.

Persons coming into the store with their faces and necks smarting from

* Read at the Fifth Session.

sunburn would be so relieved from one application of it that they would forget all about their trouble. In some kinds of eruption it will stop the itching at once. A man whose hands were almost useless to him in winter from swelling and soreness, found perfect relief from using it at night. When applied freely to the skin the glycerin is quickly absorbed, but the albumen of the egg forms a film on the surface, which, though invisible, is effectual in excluding the air. This film is pliable, and, not contractile like collodion, and the glyconin can be easily applied over large surfaces. It seems reasonable that an article possessing these properties should be found applicable in a variety of cases which I have not mentioned.

In 1873 I had to make an emulsion with cod liver oil with yolk of egg, as prescribed by Dr. Geo. M. Beard. I found it very difficult to make, from its becoming too thick with the yolk of egg. I then tried the glyconin, which I had on hand, and found it to work well. I then modified the formula, increasing the proportion of the oil by substituting spirit of bitter almond for bitter almond water as a flavoring, and it was soon published. I had previously communicated to the Alumni Association of the New York College of Pharmacy the fact that with glyconin a good emulsion could be made.

The emulsion was used quite extensively in New York and Brooklyn, but I never found a brother pharmacist who had even heard of glyconin before this formula was published, accompanied with directions for making it.* By melting simple ointment (made with yellow wax), and emulsifying while warm with one-fourth its weight of glyconin, and coloring with carmine, I have made an excellent lip-salve, which I have kept for two or three years without change.

NOTES ON THE PHARMACY OF HYDRONAPHTHOL.†

BY THOS. D. M'ELHENIE.

Hydronaphthol was introduced about a year ago by Messrs. Rigney and Wolff, of New York. The principal literature on the subject is a series of articles by Geo. R. Fowler, M. D., of Brooklyn, on its uses in surgery, the first of which appeared in the "N. Y. Med. Journal" for October 3, 1885. About this time, at Dr. Fowler's request, I prepared two cases of sponges with the new antiseptic, for use in St. Mary's Hos-

* The glyceritum vitelli was adopted in the "Pharmacopœia" for 1880, but this was not actually published until about ten years after I had called attention to it; and it seems that it is proposed now to leave it out of the next edition.

† Read at the Fifth Session.

pital, and have taken some interest in it since. Dr. Fowler reviews the chemistry of hydronaphthol, showing its relation to the phenol series, and then describes very exhaustive investigations into its antiseptic properties. A few notes on its chemical nature may not be out of place here. There are two hydroxyl substitution compounds of naphthalin, known as alpha and beta naphthol, made by heating naphthalin with sulphuric acid. Alpha naphthol is formed between 60° and 90°C . and beta naphthol between 180° and 190°C . The alpha or beta naphthol monosulphonic acid thus formed is decomposed by sodium hydrate into sodium naphtholate, sodium sulphite and sodium hydrate. The sodium naphtholate when decomposed with hydrochloric or sulphuric acid yields naphthol, which is then purified by sublimation. The term "Hydronaphthol," although slightly vague in a scientific sense, indicates the origin and chemical kinship, and is a convenient term for commercial use. It is found to be about twelve times as strong as phenol in antiseptic power, and possesses several other advantages over that substance. It is non-irritant, non-corrosive and non-poisonous. The latter point was definitely ascertained by Dr. L. Wolff, of Philadelphia, by physiological experiments conducted at the Jefferson Medical College. It is soluble in 1000 parts of water at 60°F . and in 100 parts at 212°F . from which the excess separates on cooling in, beautiful brown feathery crystals. The saturated solution ($1:1000$) has a slight aromatic odor, but is practically tasteless. In somewhat stronger warm solutions it has a bitterish, pungent taste. It sublimes at 90°C . It occurs in silvery-white, pulverulent laminae, and dissolves in 4 parts of alcohol, 3 parts of ether, and about 10 parts of cotton seed oil. The latter requires the heat of a water-bath, but remains permanent on cooling. All these solutions show a black sediment on standing, probably some tarry impurity, which will be gotten rid of as the process of manufacture is improved. It dissolves in 10 parts of glycerin at the heat of a water-bath, but is almost entirely recrystallized on cooling, and remains suspended for days. It is stated by the manufacturers to be truly soluble also in chloroform and benzol. These I have not confirmed, but from the nature of it, it seems probable. Hydronaphthol is not germicidal, at least in the proportion 0.5 per cent., five times the strength of a saturated aqueous solution, but is reliably antiseptic in proportion of 0.1 to 0.05 per cent., preserving solutions of beef, glue, gelatin, starch, gum, fresh urine, etc.

Thinking that so valuable an antiseptic must prove useful in various ways in pharmacy, I have been testing it during the summer, and note the following behavior to reagents. In all cases the saturated aqueous solution was employed. This solution exposed to sunlight soon begins to darken, passing through various shades of opalescence, becoming brown after a month or so, and depositing a film on the entire inner surface of the bottle.

With Tinc. Ferri Chlor.,	No change resulted.
“ Tinct. Iodine,	Discharged color of first 2 or 3 drops, but became opaque on further addition.
“ Aq. Ammonia,	Slight purplish tinge, changing to straw color after some hours.
Liq. Potassæ,	No change.
Acid Tannic,	“
“ Salicylic,	“
“ Acetic,	“
“ Sulphuric conc.,	“
“ Hydrochloric conc.,	“
“ Phosphoric conc.,	“
“ Nitric conc.,	An orange yellow color, changing in a moment to a dense turbid olive green by transmitted light, and dull purple by reflected light.
“ Nitro-Hydrochloric conc.,	Same as Nitric.
“ “ “ dil.,	No change.
“ Nitric dil.,	“

Among the first uses to occur to the pharmacist will be the preservation of alkaloidal solutions. I have prepared some for trial, but they are too recent to prove anything at this meeting, being only made within three weeks; but I think that a solution of Hydronaphthol, say 5 or 7 grains to a pint of distilled water, will furnish a perfect basis for delicate solutions. I have noted, however, one exception; sulphate of strychnia is decomposed, and probably reduced to the alkaloid. The use of hydronaphthol will enable pharmacists to prepare fresh beef juice, by sprinkling on the finely chopped beef a little of the powder, say 10 grains to the pound, warm over a fire to about 130° F. and press quickly. The product would contain all the albumen, and be infinitely better than the commercial meat extracts. The physician would best appreciate this after restoring a patient from extreme debility.

ON PASTE FOR LABELING.*

BY LEO ELIEL, SOUTH BEND, IND.

QUERY No. 83.—*What is the best paste for labeling bottles, and how can paste be best preserved?*

This query, upon first appearance, seems a very trivial one, but when we consider the frequency of the calls for the paste-pot in the drug shops, its pertinence is at once apparent. Every Pharmacist has his own way of making paste, and though well aware that this article is looked upon as

* Read at the Fifth Session.

being in a general sense hardly worth the time spent upon it for experiments, yet it should receive our same careful attention as matters of greater import. It is the careful attention to these minor matters, that proves itself the main factor to success in our profession and business.

The paste-pot, like unto the immaculate towel of the average drug shop, is a thing to be used, and seldom is found in condition suitable for exhibition in the front window. It is of frequent occurrence to find the paste dried up and the brush hardened and firmly attached to the bottom of the pot. In our haste to finish some work in hand, we rudely disturb its peaceful rest and fond attachment, and what matters it if we do loosen a few bristles, to the annoyance of the next one who may have occasion for its use? Then again this same pot develops a well-marked desire and tendency to accumulate its pent-up energy on the edges, especially the inner one. This no doubt is a kind provision of nature, protecting its contents from evaporation, though it rather impedes the easy removal and return of the brush. There are many other peculiar features that might be mentioned in this connection, but time forbids.

There have been so many formulas published for pastes and mucilages (for bottle labeling), that one would think there was no room for more. Pastes and mucilages for shop use are best kept in a covered wide-mouthed jar, tall enough to permit the brush to remain inside with the cover on. It should never be allowed to become encrusted with hardened paste, and the brush should frequently be cleaned. The formulas here presented with samples are not original with the writer, but have been in use by him for many years with entire satisfaction.

No. 1. Gum tragacanth 1 oz.
 Gum arabic 4 oz.
 Solve in water 1 pint, strain.
 And add thymol 14 grains, suspended in
 Glycerin 4 oz.
 Add water to make two pints.

This makes a thin paste suitable for labeling bottles, wooden or tin boxes, or for any other purpose paste is ordinarily called for. It makes a good excipient for pill masses, and does nicely for emulsions, the very small percentage of thymol not being of any consequence. This paste will keep sweet indefinitely, the thymol preventing fermentation. It will, on standing, separate, but a single shake will mix it sufficiently for use.

No. 2. Rye Flour 4 oz.
 Powd. Alum $\frac{1}{2}$ "

Rub to a smooth paste with 8 oz. of cold water, strain through a cheese

cloth, and pour into one pint of boiling water. Continue heat until thickened to suit. When nearly cold add :

Glycerin	1 oz.
Oil of Cloves	30 drops.

This is suitable for tin or wood boxes or bottles, and keeps sweet for a long time.

No. 3. Rye Flour	4 oz.
Water	1 pint.
Nitric Acid	1 drachm.
Carbolic Acid	10 minims.
Oil of Cloves	10 "
Glycerin	1 oz.

Mix flour and water, strain through cheese cloth, add nitric acid. Apply heat until thickened to suit, and add other ingredients when cooling. This is suitable for bottles, tin or wood boxes, and will not spoil.

No. 4. Dextrin	8 parts.
Acetic Acid	2 "
Alcohol	2 "
Water	10 "

Mix dextrin, water and acetic acid to a smooth paste, then add alcohol. This makes a thin paste, and is well suited for labeling bottles and wooden boxes, but is not suitable for tin boxes.

ON THE DETERMINATION OF MELTING POINTS.*

BY HENRY C. C. MAISCH.

A pharmacist has many compounds of different properties to work with. A method for the determination of melting points used with one of these compounds may work well, while it can be used for few others. We must consequently adapt the method to each subject under consideration ; thus phosphorus could be melted under water, but not on mercury, while the different camphors may be melted on the latter. From these remarks it can easily be seen that the best manner of treating the subject of melting points would be to class those articles together whose melting points could best be determined by the same method. The headings under which I propose to consider the different methods are as follows: Class I. Camphors, resins, waxes and alkaloids. Class II. Fats. Class III. Substances not readily oxidized. Class IV. substances easily oxidized in contact with air.

* Read at the Fifth Session.

CLASS I. *Camphors, Resins, Waxes and Alkaloids.*—A convenient and practical method, which I would advise being used for this class, is the following: A small beaker is filled two-thirds full of mercury, into which a thermometer is suspended, so that the mercury just covers the bulb of the thermometer. A small quantity of the article under examination is placed directly on the mercury, and kept as close to the thermometer as possible. Heat is then gradually applied so that the rise of the mercury in the thermometer does not exceed two or three degrees Fahrenheit a minute. When the first indications of melting are visible, note the number of degrees, and carefully regulate the heat so as to keep the temperature stationary at this point for a little time, to see if the whole quantity will melt. If the article under examination does not melt completely, again apply heat very carefully until the whole quantity is melted to a transparent liquid. The temperature at which this takes place can be regarded as the melting or fusing point, near enough for all practical purposes, though if greater accuracy is required it is first necessary to examine a body with a known melting point, under the same conditions as are those when examining the body with the unknown melting point. We obtain thus the ratio of variation in this particular instance, and the required melting point can then easily be obtained from the given data. This comparison can be used in all subsequently named classes.

CLASS II. *Fats.*—The above method can be used here also, but it will not give such satisfactory results as the following: A small thin walled glass tube is drawn out very fine, and the melted fat then sucked up into the tube, the capillary portion of which is then melted to a point. The part to be used is then laid aside for two or three days in a cool place. The tube is then attached to a thermometer by means of a rubber band in such a manner that the capillary portion is as close to the bulb of the thermometer as possible. The apparatus is now placed so that the liquid, either water or sulphuric acid, just covers the bulb of the thermometer. Now gradually apply heat, being careful about the rise of the mercury in the thermometer. The melting point is that degree at which the fat becomes transparent. Another method is to have the capillary tube open below and note the temperature at which the fat is pressed upward in the tube. This latter method does not give as accurate results as the former, some fats becoming very soft before they are entirely melted; but it can be used to good advantage in the determining of the melting points of some resins and waxes.

CLASS III. *Substances not readily Oxidized.*—The method given under Class I. can be used here, but only in such cases where no reaction takes place. Where this method cannot be used, we must resort to the sand bath and a thin porcelain capsule. The temperature registered by the thermometer, if placed in the sand-bath, will be several degrees too high; as a correction we can use the comparison mentioned under Class I. Or

the bulb of thermometer is immersed in the material, which is slowly heated to liquefaction.

CLASS IV. *Substances easily Oxidized in contact with Air.*—Sulphur, phosphorus and other bodies which easily burn or oxidize, or in which there takes place dissociation or other chemical change when heated in air, must be melted in some liquid in which the article under examination is not at all or only slightly soluble, and with which no chemical decomposition takes place. The best manner in which to apply this method is to suspend a piece of the substance in the liquid and keep the bulb of the thermometer as close as possible to it. This method has been tried by Gerardin (*Comp. Rendues*, 1862, liv. 1082) with sulphur and phosphorus in different media, and he found the melting point to be invariably 111.5°C . and 44.2°C . respectively.

At various times descriptions of apparatuses for the determination of melting points have been published, of which the following may be briefly mentioned: Dragendorff (*Analyse der Pflanzen*, 12, 13) does not apply heat directly to the beaker spoken of under Class I. He allows the rim of the beaker to rest on the top of a filter drier, and covers the whole with a bottle, the bottom of which has been taken out. The thermometer is suspended through the neck of the bottle and is there fastened by a cork. The whole apparatus stands on an iron plate, the filter drier being of such a height that the beaker does not rest on the plate. Heat is now applied gradually to the iron plate, carefully regulating the temperature.

Another form of apparatus has been described by Gustav Oldberg (*Rep. d. Anal. Chem.*, 1886, 94.) The apparatus consists of two glass tubes of different diameters. A bulb is blown into one end of the narrower tube, and the tubes are then connected above and below with each other by two glass tubes, the upper one being the widest and being attached somewhat slanting. The apparatus is then filled with water or some other liquid, so as to almost fill the upper connecting tube. A thermometer with the subject under examination in a fine glass tube is then adjusted so that the bulb of the thermometer is in the bulb of the apparatus. The liquid in the apparatus is then heated gradually in the wide upright glass tube.

Authors differ very much in regard to which point shall be taken as the melting point. F. Rüdorff (*Pogg. Ann.*, 1870, cxl., 420) holds that the congealing and melting points are identical, and that the temperature at which the substance congeals shall be regarded as the melting point. Other authors opposed to the foregoing hold that the congealing and melting points of certain bodies are at different temperatures.

In conclusion I would like to make a few remarks as to the value of the melting points given in the *Pharmacopœia*. Melting points should not be given in the *Pharmacopœia* except in such cases where they are necessary for establishing the quality of medicinal articles, for example acidum

aceticum glaciale, oleum theobromæ, petrolatum etc. The melting points of the various alkaloids and several other articles, not being useful for this purpose, are entirely out of place. The Pharmacopœia should state the general effect of heat, if characteristic for the drug; but it should only contain such melting points as will be necessary for testing the purity of the material, and all the rest should be left where they belong, viz., to the text books.

NOTES TO A FEW OF THE QUERIES.*

BY H. T. CUMMINGS, M. D., OF PORTLAND, MAINE.

QUERY No. 5.—*A preparation of commerce is now sold under the name of nitrous ether. Is it possible to keep such a substance, in order to prepare the spirit extemporaneously?*

We believe that if the eminent firm of manufacturing chemists and pharmacutists, whose offer upon the market of concentrated nitrous ether first attracted our notice, had looked before they leaped, we should not have had this question offered for consideration. Thirty years ago Dr. Squibb communicated a paper to the "American Journal of Pharmacy" in which, although in so many words, *not* definitely expressed, he conveyed a doubt of the stability of *spiritus nitri dulcis*, which would imply a still stronger doubt as to that of the concentrated nitrous ether; and this doubt seems to be confirmed by what we find in Gmelin, Hand-Buch iv., 763, where the decomposition of nitrous ether is especially considered.

"This ether becomes acid by long standing in bottles filled and stoppered (or corked) and containing air, and the quicker by distillation. It is supposed that the combined nitrous acid becomes free nitric acid. According to Monheim, however, the acidification depends merely upon absorbed nitrous oxide, which has been changed into nitric acid by attraction of oxygen from the air. If therefore, *spiritus nitri dulcis*, (a mixture of nitrous ether and alcohol) is allowed to remain for a long time in contact with the air, or is shaken with it until it takes up no more oxygen, and is then freed from the developed acid by drawing it off over magnesia, it will not become acid afterward. According to Stolze, the oftener *spiritus nitri dulcis* treated after Monheim's way is exposed to the air, and neutralized by magnesia, it constantly becomes more feeble because in this manner all the ether is gradually destroyed. According to Flashoff *spiritus nitri dulcis* becomes stable by several days' contact with $\frac{1}{2}$ part manganese binoxide, the oxygen of which substitutes that of the air, and distillation over magnesia. But, according to Duflos, this spirit becomes sour unless it is dehydrated by distillation over calcium chloride. Braun

* Presented at the Fifth Session.

also recommends this dehydration by calcium chloride, but Geiger doubts whether thereby a part of the nitrous ether is not changed into chloric ether, which Schmidt and Duflos found to be the case; hence Schmidt shakes the spirit with potassium carbonate in a capacious bottle, then rectifies it over strongly dried white bole, whereby a spirit is obtained which is stable if kept in flasks completely filled and well stopped; while Duflos first neutralizes the crude spirit with pulverulent lime hydrate, and then dehydrates it by distillation over lime nitrate, or better, potassium carbonate. According to Duflos, this spirit keeps for a whole year, and does not redden litmus paper, unless by addition of water, which provokes decomposition."

Gmelin's summary of all this is: "Perhaps free acid is already present, which first exerts its reaction upon litmus by the addition of water. In this case success has not been attained, and perhaps it never can be, to prepare a perfectly subtle *spiritus nitri dulcis*."

We have never seen but one sample of the preparation in question, and that purported to be a nitrous ether diluted with alcohol in the proportion of 1 in 10, ostensibly to protect it from oxidation. This expedient did not prove to be a success, for the acid was evident to smell and taste, and strongly and instantly reddened litmus paper.

Gmelin describes seven different processes for preparing nitrous ether, each modified by one or more of twenty-six chemists, some of them the foremost names in Europe, in this field. A review of some of them may not be uninteresting.

The first—and the second is like unto it, with a slight variation, in proportion and manipulation—is described as follows: "In a stout, well-corked and thoroughly cooled flask, fuming nitric acid is mixed with alcohol. After some days the liberated gas is allowed to issue through a puncture in the cork, and the layer of ether which has risen to the top is withdrawn by a separating funnel." Gmelin observes that on account of the liability to explosion, this operation is rather dangerous. We should think so!

The third consists of the distillation of a simple mixture of alcohol and nitric acid. It appears to be the most popular of the seven, as 11 out of the 26 chemists quoted have tried their hands upon it. If our memory is not at fault, this is the U. S. Ph. process of 1870, and is the one we have worked with tolerable success.

The fifth consists in adding to the mixture of acid and alcohol some deoxidizing constituent which will reduce the nitric to nitrous acid without involving the expense of a part of the alcohol. In this process E. Kopp's practice is clearly the best. He introduces into a distilling apparatus equal measures of alcohol and nitric acid, together with some copper filings or clippings. The reaction, even in large quantities is never violent, and the distillation is completed almost without the application

of external heat. The vapor is first conducted through a flask full of water, then through a long calcium chloride tube, is condensed in a receiver surrounded with a freezing mixture, as perfectly pure nitrous ether free from aldehyde, and consequently not turning brown with potash.

QUERY NO. 6.—*What is the proportion of nitrous ether in the officinal concentrated nitrous ether of the Pharmacopœia?*

We would answer the sixth query by another: Is there a *concentrated* nitrous ether directed in the Pharmacopœia? We can find none except that which is to be immediately diluted with alcohol to form the *spiritus ætheris nitrosi*, and that of course should be 100 per cent. In this spirit, the Pharmacopœia demands 5 per cent. of nitrous ether, but whether the apothecary or the patient gets that in all cases, can only be determined by the appropriate tests.

QUERY NO. 13.—*Does the commercial compound spirit of ether contain the ethereal oil as required by the Pharmacopœia?*

We do not know how it is now, but while we were in active practice in pharmacy, a period of 25 years, we never saw any compound spirit of ether which contained ethereal oil. until we imitated and repeated Dr. Squibb's experiments in our own imperfect way with limited accommodations and apparatus. The *commercial* article then furnished corresponded to Dr. Squibb's description of it in his article on the subject in the "American Journal of Pharmacy" 29 years ago, and we confess that to-day we should be shy of any package purporting to contain it, which did not bear the label and other genuine marks of coming from the laboratory of either Dr. Squibb or Prof. Diehl. Cupidity on the one hand, and ignorance on the other, have combined to destroy faith in, and the reputation of, a remedy which formerly commanded the confidence of the medical profession. It would seem, moreover, that whether Hoffmann's anodyne contains ethereal oil or not, is practically of very little consequence, since in these days of elixirs, fluid extracts, sugar-coated pills, and elegant pharmacy generally, old, reputable, and well established remedies are relegated to the back seat, or are driven further to the wall or else quite out of court.

QUERY NO. 16.—*Cannot a more economical process than the officinal be suggested for making ethereal oil?*

When the best results obtained by practised, skillful, and scientific operators show that it requires from 10 to 11 pounds of sulphuric acid, and from $4\frac{1}{2}$ to 7 pounds of alcohol to produce 1 ounce avoirdupois of ethereal oil, this question is one which will naturally force itself upon the attention of every one at all conversant with the matter. This enormous

waste seems to arise from the formation of several compounds, the production of which is not sought, viz.: sulphuric ether, carbonic acid, carbonic oxide, olefiant gas, acetic acid, acetic ether, sulphurous acid, and thiomelanic acid—all at the expense of the alcohol, though sulphuric acid has some share in the most of them. In Dr. Squibb's paper on this subject, printed in the "American Journal of Pharmacy" in 1857, he remarks: "The great disproportion between the materials and the product under the most favorable circumstances, makes it most desirable that some economical process should be found for this preparation, and the writer has been long under the impression that by the distillation of anhydrous sulphovinates better results might be had. The few crude trials made in this direction have, however, thus far, given no hope of success, so far as practical application is concerned." The volume and amount of thiomelanic acid would seem adequate to account for this waste of alcohol, especially when we take into account the preponderance of carbon in its composition, none of which can be derived from the acid. A mean of four analyses gives 66.67 per cent. of carbon in this compound. And it seems to us that when this black mass is fully formed, the distillation of sulphovinic acid is practically terminated, all the alcohol having been consumed, and only terhydrated sulphuric acid remaining entangled in its interstices or vesicles.

But what is *Oleum æthereum*? From the variety of nomenclature employed it should seem that chemists entertain widely different views of its constitution. But one thing is certain, that sulphovinic acid is an important constituent thereof, and it may not be irrelevant to our discussion to consider the formation of this compound.

"Oil of vitriol mixes with alcohol with a remarkable evolution of heat, increasing even to ebullition of the uncombined alcohol, and is thereby changed, provided the mixture is not kept too cold, into sulphovinic acid and dilute sulphuric acid.

"This formation of sulphovinic acid was discovered by Sertuerner. It was noticed that the mixture after dilution with water, upon digestion with excess of lead oxide, or barium or calcium carbonate, yielded a smaller amount of sulphate than would have been expected; and that the liquid filtered from the sulphates, contained an easily soluble crystallizable salt, the sulphovinate. As the sulphuric acid, by its conversion into the sulphovinic, lost half its saturating capacity, while 1 atom (molecule?) $C_4H_9O_2, 2SO_3$ saturated no more base than 1 atom (molecule?) SO_3 , then the amount of sulphovinic acid in the mixture was easily calculated from the amount of base which now would saturate this mixture.—Gmelin. H. Buch, iv. 569.

Gmelin proceeds to quote the experiments of several chemists who succeeded in utilizing from 60 to 80 per cent. of the sulphuric acid employed in the operation for the formation of sulphovinic acid. The proportion

of alcohol thus utilized is not stated, but we seem to be left to the inference that it was all utilized, as the alcohol is ordinarily in considerably less quantity than the acid. This seems rather remarkable, in view of the experience of Dr. Squibb and Prof. Diehl in distilling such mixtures.

As this matter is very instructive we quote further from the section on sulphovinic acid: To 1 atom (46 or 55 parts) absolute or 85 per cent. alcohol surrounded with a freezing mixture of ice and salt, is added 1 atom (49 parts) oil of vitriol, slowly and with constant stirring, so that no heating can take place; the mixture contains no sulphovinic acid, not even after several days, provided that it is surrounded with melting ice. But at 10° to 15° C., the sulphovinic acid gradually makes its appearance, so that after three or four days 77 per cent. of the sulphuric acid is thus converted. This takes place at 30° to 35° in a few hours, and on immersing the mixture in boiling water, in a few minutes; but strong sunlight has no influence upon it. If sufficient alcohol is poured into oil of vitriol, to induce strong heating, the complete formation of sulphovinic acid follows instantly. This proportion of sulphovinic acid does not increase by continued immersion and heating; of 100 parts of sulphuric acid, when equal parts of alcohol and acid are employed, 77 are converted into sulphovinic acid. With 2 atoms absolute or 85 per cent. alcohol, the same phenomena are exhibited, but in this case it is much easier to hinder the formation of sulphovinic acid by cold, and by warming the mixture 73 to 74 per cent., at most, of the sulphuric acid are converted into sulphovinic acid. On the other hand, by the employment of 1 atom alcohol to 2 atoms acid, sulphovinic acid is formed under all circumstances, even under severe cold, and then there is always 55 per cent. of sulphuric acid changed into sulphovinic acid, whether the alcohol is poured into the acid or the reverse, whether it is cooled or not cooled, whether the mixture is immersed and heated long in boiling water or not, in which it suffers no loss of weight, (a proof that the alcohol used for the formation of the sulphovinic acid is not in any manner combined.) Gmelin H. Buch, iv. 570.

Of the treatment of the sulphovينات for obtaining the *oleum æthereum* we have the following description: Crystallized calcium sulphovinate is carefully and completely dried *in vacuo*; it is then subjected to distillation, and the distillate is purified as follows: The distillate is shaken with ice-cold water, which frees it from sulphuric acid and part of the sulphurous acid, alcohol, and ether; it is separated from the water, and introduced under the receiver of an air-pump, which is slowly and gently worked, so as to evaporate the ether and sulphurous acid, without creating too violent ebullition." Gmelin, H. Buch, vi. 538.

From the foregoing observations by an accomplished European chemist, it should appear that nothing is easier than to prepare sulphovinic acid in quantities to meet any requirements. The chief difficulty to be

encountered seems to be the proper preparation and treatment of the sulphovinate before distillation, and the management of that process. We have received the impression from the operations for ethereal oil by the distillation of the mixture of alcohol and acid, that sulphovinic acid was very sparingly produced; but when we learn that from 50 to 75 per cent. of any given quantity of sulphuric acid can be thus easily and rapidly converted, it seems to open the way to a far more economical and productive, though more operose, process than we had thought possible. We know nothing of the difficulties to be encountered, or the phenomena to be observed in conducting this operation, but we hope that the desponding tone of Dr. Squibb's remark, quoted above, will not deter any one possessing the necessary means and appliances from traveling in the road indicated above with certainty and success.

QUERY NO. 57.—*The green color in oil of cajeput is generally due to copper, sometimes to chlorophyll. Is the contamination with copper still prevailing, and if so, how much copper does the oil contain, or how much can it take up, and in what condition does the copper exist in the oil?*

We quote once more from the authority already so often appealed to with instruction and satisfaction: "Commercial cajeput oil generally contains discolored copper, by which its originally green color is deepened, for it is met with of a greenish color without containing copper. The copper which enters the oil from being dispatched in copper flasks can never, according to Doebereiner, be recognized by its deeper blue upon being shaken with ammonia, nor is it easily thrown down by potassium, iron, or zinc, but is better detected by the electric current. If the poles of a voltaic battery are immersed in cajeput oil mixed with water, the wire of the positive pole becomes covered with copper oxide from the copper contained in the oil; the wire of the negative pole liberates hydrogen; upon the addition of aqueous ammonia, both poles liberate gas, while flocculi of copper form at the negative pole, and the oil becomes yellow. The dissolved copper may also be detected on shaking the oil with aqueous potassium cyanide, by the red precipitate of copper cyanide. The copper may also be separated by distillation, as it passes over only in the last portion of the distillate (Schoenfelder and others), also by shaking with animal charcoal. (Vasmer.) A Paris cajeput oil contained, according to Guibourt 0.022 per cent. of copper." Gmelin, H. Buch, vii. 312.

QUERY NO. 83.—*What is the best paste for labeling bottles, and how can paste best be preserved?*

A flour paste which we have used with more satisfaction than anything else we have ever tried, is made as follows:

Put into a skillet or pint tin pan eight fluidounces of water and one-

half ounce of alum; set this over your oil-stove or other source of heat, and let it come to a boil.

While waiting for it to boil, weigh out two ounces of good flour, and put it into a mortar; gradually add four ounces of water, stirring the mixture to a smooth cream free from lumps. By this time your alum water perhaps is boiling; if so, decant your mixture into it, and stir till the flour is cooked, which you will know by its change from a dead white appearance to an opalescence like that of boiled laundry starch.

Remove from the fire and allow it to cool. While still a little warm, add and stir in 15 drops of a mixture made of wood creosote and oil of cloves, two drachms each, which it would be well to prepare and keep in a bottle for this very purpose.

For this quantity of paste, do not use more than one-half ounce of alum, else you will be anathematizing the careless fellow who dropped your paste brush on the gritty floor, and put it back without cleaning it. An excess of alum will fill the paste with small crystals, very like grains of sand.

Paste prepared in this way will keep an indefinite length of time without souring or moulding. It will bear frequent additions of water as it becomes dry.

II. CHEMISTRY.

SPIRIT OF NITROUS ETHER.*

BY EMLÉN PAINTER, OF NEW YORK.

Being engaged a few years since in the manufacture of different ethers on a considerable scale, and in studying the subject, devising a practical method for making muriatic ether (which eventually proved eminently successful), it became clearly manifest to my mind that spirit of nitrous ether was not made by a proper, or at least, the most rational method.

When I began to consider, however, the very general use of this article throughout America as well as Europe, the immense quantities of it produced, the very able men who have experimented with it in the different manufacturing establishments, and the amount of literature we have on the subject, I concluded that my plan was probably impracticable—though for reasons not then apparent to me—and that it must have been tried on a manufacturing scale and found wanting.

It is stated in Fowne's Chemistry, as well as in other works, that the *only* method of making nitrous ether *pure*, is a different one from the

* Read at the Third Session.

methods in use in all the different manufacturing establishments (so far as I know), and different from that of the Pharmacopœia. To satisfy my mind on the subject, and if possible to turn out a better product, I began experimenting, but before I had reached any definite conclusions, I was overcome by protracted illness, which finally resulted in an entire change in my social and business life. Until recently, I had not experimented further in this matter, yet it was in my mind to do so whenever opportunity offered.

Although working at great disadvantage, in not having sufficient time to devote to it, suitable room, or appliances, I beg to present my ideas, with a review of the experiments I have made, and the deductions therefrom, trusting that they may assist in some degree in supplying pharmacy and medicine with a better article of spirits of nitre.

It is, I believe, an universally accepted fact that a mixture of nitric acid and alcohol, with sufficient heat applied to cause a reaction, produces invariably, besides nitrous ether, aldehyde, ethyl nitrate, and other nitrogenous products, contaminating in a greater or less degree the distillate of nitrous ether from such a mixture, varying according to the temperature maintained, the changing strength of the alcohol as the operation proceeds, and the quantity of material acted upon. The separation of pure ethyl nitrite from the distillate is so difficult a task, especially from the aldehyde, that there is probably not a sample of spirit of nitre on the market that does not contain more or less of this impurity.

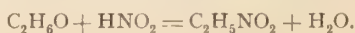
Then why mix at all the nitric acid with the alcohol, when by first reducing the acid to nitrous anhydride, and passing this gas into alcohol under favorable circumstances, ethyl nitrate free from aldehyde is produced? I do not claim any novelty in this way of making nitrous ether, as before inferred, and I can't conceive how it is that a working method after this plan has not long since been brought into successful operation by the manufacturers of this ether.

Before detailing my plan of manipulation (which is very simple indeed), let me point out more particularly some of the objections to the present methods.

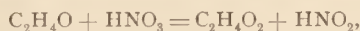
The first step in the reaction between alcohol and nitric acid to form nitrous ether is necessarily a deoxidation of the acid; the alcohol, being the reducing agent, is consequently oxidized, thereby forming aldehyde in the very first stage of the process, as well as nitrous acid and water, as is more clearly shown by the following equation:



Then with a second molecule of alcohol the reaction with the nitrous acid in its nascent state forms nitrous ether:



The temperature at which it is formed, however (between 150° and 200° F., the temperature required to produce a reaction with nitric acid), is far above that which is necessary to form nitrous ether with the resulting nitrous acid; other nitrogenous compounds are consequently simultaneously formed, or else a portion of the ether is immediately split into other combinations, nitric oxide gas being one of the results, which gas can readily be detected at the exit of the condenser. Hydrocyanic acid is also possibly then produced beside the aldehyde, acetic acid and acetic ether, all of these products having been found by different experimenters in samples of nitrous ether made by this method. In regard to the aldehyde first formed, I am aware of the theory that it reacts with another molecule of nitric acid, forming acetic acid and nitrous acid,



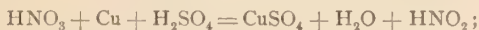
the latter acid being utilized as the first molecule formed.

This or some similar reaction is undoubtedly the case, otherwise the distillate of nitrous ether would be contaminated by aldehyde in a far greater degree than it is, but the aldehyde is not all decomposed; more or less of it distills over and is condensed with the ether. The boiling point of aldehyde is 71° , whilst the boiling point of alcohol is 173° ; a considerable quantity of the latter always distils with the ether, so that is reasonable to infer that aldehyde distils with it as well.

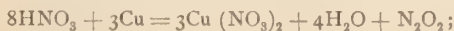
The use of copper, first recommended by Prof. Redwood with the view of supplying a reducing agent for the nitric acid without resorting to the alcohol present, appears at first a very plausible theory, but in practice it certainly does not merit the distinction this method has attained. In my opinion it is worse than useless, or rather the disadvantages overbalance by far the advantages derived from its use. It fails in its object (the supplying of nitrous acid), and works an advantage only mechanically in regulating the action in the retort, which seems to proceed more regularly with it, and possibly at a somewhat lower temperature. This same end can be attained however by the use of sulphuric acid alone, or of sand, glass, fragments of pumice stone, etc., as shown by different experimenters.

In my experience by careful manipulation a larger yield of nitrous ether can be had from a given quantity of alcohol and acid without the copper than with it.

The theory of the formation of nitrous acid from the mixture of copper, nitric acid, and sulphuric acid, looks very pretty:



but in practice, I think, it is more like this:



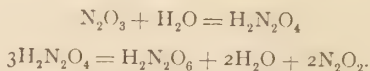
the sulphuric acid comes in the equation afterwards, and merely displaces the nitric acid in the copper compound; at all events it is a known fact that nitrogen dioxide gas (N_2O_2) is evolved, giving off red fumes in contact with the air, when copper and strong nitric acid are brought together.

The nitrogen dioxide formed in the retort passes through the condenser and escapes, carrying with it a very considerable quantity of the vapor of nitrous ether, no matter how extensive and well cooled condensing surfaces one may have. I was told by one manufacturer, that his Liebig's condenser extended the whole length of a large room, 50 ft. or more, and still ether escaped uncondensed. I have passed the distillate of crude ether—using copper in the process—through 60 ft. of coil surrounded from one end to the other with a freezing mixture of ice and salt—so cold indeed was the condenser that before the operation was finished the coil filled up with ice, by abstracting the moisture—and yet more or less of the ethereal vapor escaped. This is explained by the fact that nitrogen dioxide is being formed continuously, and not being condensable carries with it mechanically some of the ether vapor; on the same principle that in starting the distillation of a very volatile liquid (as doubtless we all have observed) uncondensed vapors will escape at first, and that condensation is never complete until all the air is expelled.

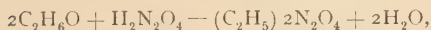
In view of the foregoing facts and the deductions made therefrom, it appears to me that a more rational method of making nitrous ether would be to first reduce the nitric acid to nitrous anhydride by the agency of cotton, starch, arsenious acid, or other suitable reagent, then pass this gas, freed as nearly as possible from nitric acid, into a mixture of alcohol and water, maintained at a temperature of about 100°F ., the vessel being connected with a well chilled condenser, and having the receiver surrounded by ice and water.

This method greatly simplifies the chemical reaction, and from my experiments I am led to believe that it is quite practical on a manufacturing scale, that the yield of ether is increased over the present method from 50% to 100%, that it is more economical, and most of all, that an ether is produced free from aldehyde and acetic ether, and almost absolutely pure when first made.

The chemical reaction may be explained thus: nitrous anhydride gas on being passed into water forms nitrous acid, which acid, however, cannot exist in aqueous solution, and by water is immediately resolved into nitric acid, nitrogen dioxide, and water, as shown by the following equations:



If however, alcohol be present in sufficient quantity, the nitrous acid ($\text{H}_2\text{N}_2\text{O}_4$) reacts with it, forming ethyl nitrite and water,



and if the alcohol be maintained in the right proportion, but little if any nitric acid and nitrogen dioxide are formed.

It is unnecessary to give in detail the series of experiments made, yet it may be interesting to review briefly the steps taken. In my first experiment, made in San Francisco some years ago, I used cotton to reduce the nitric acid to nitrous anhydride. The acid and cotton were put into a flask placed over a gas-burner, and connected by a bent tube with a bottle containing alcohol of about 70%, and this bottle in turn connected by a bent tube with a condenser filled with ice and water; heat was applied to the flask to establish a reaction; the evolution of gas was too rapid, and the reaction with the alcohol was so violent that it became in a very short period beyond control, although I kept the bottle surrounded with cold water; so great was the heat produced that nearly all of the liquid distilled over spontaneously, and much of the ether was lost. The distillate was found to be strongly acid, and to have separated in two layers; the ethereal layer was then removed and found to be extremely volatile, boiling at the temperature of the room—the thermometer standing at about 65° F.

In my second experiment I thoughtlessly interposed a wash bottle containing water between the acid generator and the alcohol, and consequently did not get any ether, the water reducing the nitrous anhydride to nitrogen dioxide and nitric acid, the former escaping through the alcohol without any reaction, taking up oxygen on coming into the air at the exit of the condenser, producing the characteristic red fumes, and proving conclusively that there is no reaction between alcohol and nitrogen dioxide, the gas largely produced when copper is employed.

In experiment No. 3 I used starch as the reducing agent; a little cotton was first put into the flask that it might not be endangered by the starch caking on the bottom when heat was applied. I also used a mixture of sulphuric and nitric acids with the view of taking up water with the former acid, and also of making the evolution of gas more regular; in these particulars it was successful. In the wash bottle, before mentioned, I put a little strong alcohol; this was a mistake, but on the whole I was gratified with the outcome of the experiment, and I felt more fully convinced that it was simply a matter of repeated trials to devise a practical means of making pure nitrous ether after this plan. The result was 7 fluidounces of nitrous ether from one pint of alcohol diluted with 4 ounces of water; a larger yield might have been obtained had the distillation been carried further. This ether produced no coloration of aqueous potash, even after standing mixed for several days.

Experiment No. 4 was a failure, sulphuric acid was used in the wash bottle and 93 per cent. alcohol in the ether generator, which was kept

cooled as in my other experiments. The alcohol eagerly absorbed the nitrous anhydride gas, but very little ether distilled; when the alcohol approached saturation I allowed the temperature to rise until active effervescence ensued; I then tried to control the reaction by surrounding the generator with ice-water, crushed ice and salt, yet it still increased with such violence, that the ether vapors and gases formed were forced through the condenser without condensing, and much of the liquid from the generator was spurted out through a safety tube, which I had fortunately provided; otherwise there doubtless would have been an explosion. In the receiver were found 4 or 5 ounces of an acid liquid with a half ounce or more of ether floating on the surface, the whole of which I consigned to the sink in disgust.

In experiment No. 5 which was conducted with great care, a mixture of sulphuric and nitric acids was used, and cotton added to generate the nitrous anhydride; the wash bottle was left empty, the ether generator contained a mixture of three parts of alcohol and one of water, with a thermometer inserted in it, the condenser and receiver were surrounded with ice and salt. The flask was then carefully heated and the evolution of gas was quite regular, ether began to distil at once, the temperature of the generator was kept down to between 80° and 100° F. in the first stage of the process and then allowed to rise to 120° . A considerable quantity of ether escaped through the condenser, although it was kept throughout the operation much below the freezing point. This escape of ether was caused by nitrogen dioxide (and probably other gases) being formed and passing with the ether; uncondensable gases increased as the operation proceeded, until finally they were formed at the almost entire exclusion of nitrous anhydride; the heat was then turned off. This experiment demonstrated that cotton was not a suitable deoxidizing agent used in this manner. From a pint of alcohol, the yield was about 13 ounces of distillate which separated in two layers, about three-fourths of it being the ethereal layer.

Experiment No. 6 was conducted in the same manner as the preceding one, arsenious acid was used in place of the cotton, and another bottle containing water and magnesia was interposed between the ether generator and the condenser. The result was highly satisfactory, the condensation was complete, and the yield of ether was over ten ounces from thirteen ounces of alcohol used. This ether did not perceptibly diminish in volume on being shaken with cold water, and did not change or deepen in color when shaken with aqueous potash.

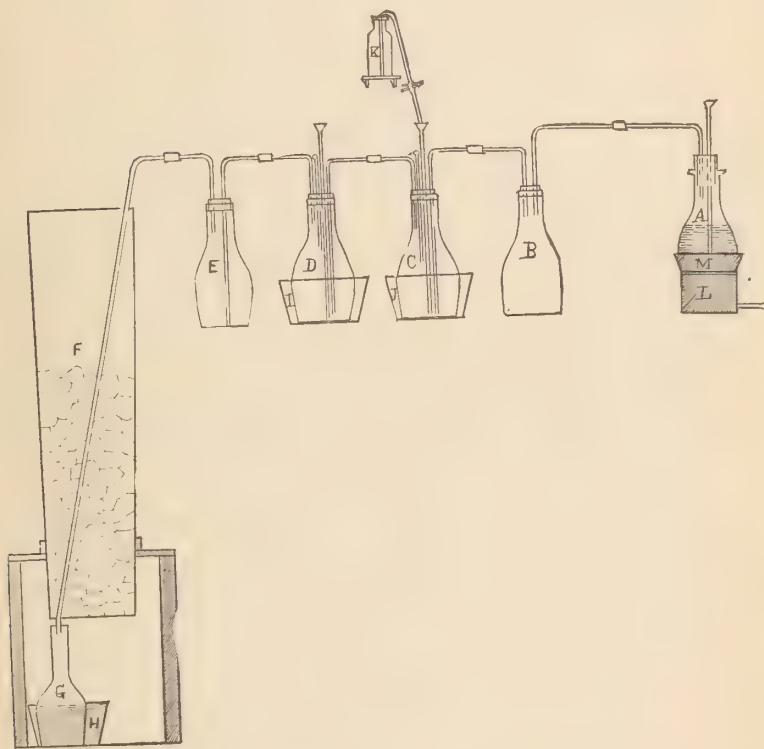
The chemical reaction may be thus explained:



the N_2O_3 passing into the water and alcohol in the ether generator, and there reacting, as explained in a previous equation.

The important question now arises, Is this ether contaminated in any degree by the arsenic used in the process? On applying the simpler tests they gave no indications of any being present; being desirous, however, of having my work corroborated on this point, I took a sample of the ether to our fellow member Dr. Rice, who kindly examined it and reported, "There was no arsenic present in the sample of ether given me for examination."

Without reviewing further my experiments, I respectfully submit the following working formula for making nitrous ether, which I find to be quite practical in a small way, and I think it will be found even more applicable on a large scale, simply increasing the size of apparatus and the quantity of material acted upon.



In the accompanying cut *A* is a half-gallon glass flask fitted with a rubber stopper, through which pass a bent tube and a long-necked funnel, the latter reaching near to the bottom of the flask. *B* is a quart bottle also fitted with a perforated rubber stopper with two bent glass tubes passing through it. *C* is the ether generator, a quart bottle fitted with a cork stopper, through which pass two bent glass tubes (one reaching nearly to

the bottom), a long-necked funnel, and a thermometer. *D* is a duplicate of *C*. *E* is the same sized bottle, fitted as the others with a cork stopper, and two bent glass tubes. *F* is the condenser, which consists of a cylindrical vessel (designed for a percolator), three feet in height, with a bent glass tube passing down through it as shown in the cut. *G* is the receiver. *H*, *I*, *J* are three pans in which *G*, *D*, and *C* respectively sit. *K* is a reservoir for alcohol with a small rubber tube supplied with a pinch-cock, and leading to the funnel of *C*. *L* is a gas-stove, on which is resting the sand-bath *M*. The bent tubes of the several pieces of this apparatus are joined by short sections of rubber tubing.

The bent tubes of *A* and *B* and the one passing to the bottom of *C* are $\frac{3}{8}$ in. in diameter, the others are $\frac{1}{2}$ in. or larger. The apparatus is charged by introducing into the flask *A*, two pounds of strong sulphuric acid, then adding very carefully, to avoid breaking the flask, $2\frac{1}{4}$ lbs. of arsenious acid, in lumps the size of a hazel nut and under. In the bottle *E* is put 8 ounces of water and about $\frac{1}{2}$ ounce of bicarbonate of soda; the connections are then made throughout. A section of rubber tubing makes a perfectly water-tight joint around the glass tube passing through the bottom of the condenser. The corks should have a liberal coating of plaster of paris extending down the necks of the bottles to insure their being perfectly tight. The condenser is then to be filled with finely crushed ice and a slight sprinkling of salt, and sufficient water added to fill up the interstices. The pan *H*, in which the receiver sits, is also to be filled with crushed ice. $2\frac{1}{2}$ lbs. of nitric acid (sp. gr. 1.42 or stronger) is now introduced through the funnel of the flask *A*; the bottle *B* is left empty; into *C* is introduced through the funnel 12 ounces of alcohol and 4 ounces of water, and half the quantity of the same mixture is put in *D*. A tub of broken ice is provided for use as the operation proceeds; one pint of strong alcohol is put in the reservoir. Heat is applied to the flask *A*, and regulated so that there will be a free and constant evolution of gas; the temperature of the generators *C* and *D* respectively is allowed to rise to 80° F., then immediately surrounded with cold water, and lumps of ice added to the pans from time to time to maintain the temperature between 80° and 120° throughout the operation. The bottle *D* is merely a precautionary provision, in the event of the evolution of nitrous anhydride gas becoming so rapid in any stage of the process that it is not all taken up in *C*, the remainder may be caught and utilized in *D*. At the close of the process *D* may be surrounded with hot water, to distil off any ether that may remain absorbed by the alcohol in it. This bottle, however, might possibly be as well dispensed with. *E* serves a good purpose, the water absorbing any alcohol that may pass into it, and the design of the soda is to take up any free acid there may be in the vapor as it passes, in which case the elimination of carbonic acid gas is of course objectionable; if the same object could be accomplished by an oxide, it would be pre-

ferable. I find that caustic lime, potash or soda does not answer, for the reason that they all decompose the ether. Magnesia or oxide of zinc does not seem to affect the ether, nor does it remove the acid completely.

As soon as the ether begins to drop from the condenser, the pinch-cock on the tube leading from the reservoir is opened sufficiently to admit of about the same quantity of alcohol flowing into the generator C, as there is ether passing into the receiver. In about three hours' time the operation will be concluded, and there will be found in the receiver about 25 ounces of nitrous ether. On a larger scale, the yield of course would be considerably greater; by this continuous process there would be left in the generator proportionally less alcohol, and by recovering the alcohol from the residues to be used in a subsequent operation, almost the theoretical quantity of ether might be obtained. At least calculation, I think that 100 parts of absolute alcohol can readily be made to yield 120 parts of ether.

In my experience, *pure* nitrous ether is too volatile a product to handle except in the laboratory of the manufacturer, and it therefore should never be sent out to the dispensing pharmacist. If there be a commercial demand for a more concentrated spirit than the officinal, I would recommend that the pure ether be diluted with at least three times its weight of alcohol, thus making a 25 % solution, then one part of this to four of alcohol would make the officinal spirit of nitrous ether. In my opinion, however, it would be still better to at once dilute it to the officinal standard. If it is desired to preserve the ether in its pure state, I think it should be perfectly dried by passing the vapor through a proper dehydrating agent (fragments of fused chloride of zinc in a tube would probably answer), and then be immediately put into small, well-fitted, glass-stoppered bottles, the stoppers smeared lightly with glycerin before being inserted, and securely tied down, and kept in a cool, dark place.

I desired to have presented with this paper a more minute description of the character and properties of the ether produced by this method, in comparison with the ether made by the method of the Pharmacopœia, but the summer weather being so unfavorable to investigations of such volatile products, my experimenting is yet too incomplete to give at present a satisfactory report on this point.

New York, August, 1886.

ON AMERICAN CARBOLIC ACID.*

BY EDGAR M. HATTON.

QUERY No 68—"Some notes concerning the carbolic acid made in America."

Bearing on the above subject, the following has been obtained: In 1866, encouraged by the experiments of Mr. Crookes with reference to the cattle plague in England, the demonstration of its value as a constituent in a salve for foot-rot in sheep, and of emulsion for use as sheep dip, and other uses in connection with cattle and sheep raising, by its use as a preservative of raw hides, also by the prevalence of cholera in America in that year, a well-known New York firm commenced the manufacture of carbolic acid on a large scale, and have been constant producers since. For a few years they made no crystals for the market.

The reports of the Paris Exposition held in 1867, show that at that time no acid was made with a higher melting point than 25° C. by any other manufacturer than Calvert, with the exception perhaps of the house of Chas. Lowe & Co., an offshoot of the house of F. C. Calvert & Co. Calvert claimed at that time that their acid, melting at about 40° C., was the only acid that would dissolve in twenty parts of water. To-day any good acid with a melting point even as low as 32° C. will dissolve in sixteen to seventeen parts of water.

This is due to the fact that German manufacturers, instead of purifying the acids by mechanical means, came to the true cause of the difficulty, viz.: the presence of sulphate of picoline, etc., and removed them by the true chemical processes. Perhaps encouraged by this at this time, in 1874 the New York firm commenced the manufacture of crystal acid for the market.

On the foregoing subject, recently, communications were addressed to a number of purported manufacturers of carbolic acid throughout the country, but with few exceptions replies have not been received. Considering the manner and style in which the communications were couched, and the way that many have remained unanswered, one is left to infer that the businesses of these parties are not as they would have them seem. Possibly it might have occurred to each that silence on his part might be unnoticed, and thereby exposure avoided. In fact, the greater part of the parties claiming to be manufacturers of carbolic acid, are either simply distillers of the crude acid oil, refiners of impure acids (mostly foreign), or re-distillers of pure imported acids into bottles. This latter process is said to have decided advantages in adding to the appearance of the crystals. Another class can be added to the above, and while last, we may judge it is not the least, viz., the party with the enterprise to put his own

* Presented at the Fifth Session.

label on another man's product. It frequently follows that those who are enterprising enough to perform this change, charge dearly for their enterprise by adding largely to the selling price. Based on information obtained, there seems to be now only one manufacturer of pure crystal carbolic in America from American coal tar. This firm probably supply upwards of one-fourth of the crystals and more than one-half of the higher grades of liquid acid used in this country, and are thought to be the only tar distillers in existence anywhere who carry the manufacture to final results. They also use much of the crude material produced by other distillers. In Europe the tar distillers are entirely separate from the acid makers. It is reported that another firm contemplates the manufacture of crystals from American coal tar. One other, some two or three years ago, did produce crystals, but has withdrawn this branch from his establishment.

There seems to be room for further manufacture from American tar, as there was last year a surplus of one hundred thousand barrels, and statistics show that the following number of pounds of acid were imported into this country for the several years named :

Year ending June 30,	Pounds.	Dollars.	Rate of duty.
1881	115,691	48,691	10 per cent.
1882	178,842	42,237	10 per cent.
1883	1,394,603	46,601	10 per cent.
1884	177,395	23,198	Free.
1885	461,548	52,288	Free.

This refers to all grades of acids brought into this country, there being no distinction made, as all grades were subject to the same rate of duty. It will be noticed that in 1884 the duty was removed. This disadvantage to American manufacturers is claimed to have been overcome by the decline, about the same time, in prices of caustic soda and sulphuric acid, both of which are quite material in its manufacture. There is no public record of exports, but there is evidence that shipments are made to the West Indies and South America.

In the form of soap, sheep dip and kindred substances, large shipments are made to South America, and frequently by the way of England. A sudden call of late from Japan quite cleared the New York markets of crystals. It is commonly known that the distillation of coal tar for the purpose of obtaining simply the crude acid is not in itself profitable, consequently other ingredients are sought for also. Some of them are produced from the aniline manufacturer, and no doubt the time is not distant when the working of the coal tar oils will be taken up in all of the large cities where gas and coal tar are largely produced, and become a very important industry in this country ; then will naturally follow a larger production of crystal carbolic acid, and there is no reason why the

foreign article should not be excluded from our market. From further information it is thought without doubt that acids are made in this country, and others perfected from foreign material that fully come up to the pharmacopœial standard, and in this respect equal any of the imported articles. One party adds, in regard to their product going beyond this standard, "and this is accomplished without using phosphoric or any other acids to maintain its colorless condition."

Samples presenting indeed a handsome appearance have been received and were sent in good faith to verify the truth of the statements made, in regard to the purity claimed for the goods. From one firm a number of samples taken directly from stock and representing the leading varieties made by them were received.

Following the several numbers will be found the description of the contents of each bottle:

Carbolic acid No. 1, melting point above 36° C.

Carbolic acid No. 2, melting point above 32° C.

Carbolic acid No. 3, common crystal, uncertain as to melting point and color.

Carbolic acid No. 4, 90 to 95 per cent. pure phenol, the rest water to keep it liquid at ordinary temperature.

Carbolic acid No. 5, cresol of light color, no impurities save water.

Carbolic acid No. 6, cresol and xlenol, containing some neutral oils and naphthalin, 80 to 85 per cent.

Carbolic acid ———, 60 per cent. crude. Also a bottle of creasote.

The crude acid is reduced to any strength desired by the trade, even as low as ten per cent. with the inferior tar products. These packages when sold to the trade are branded with the percentage of acid contained therein. It can readily be seen how the retail trade and the public generally can be deceived in this crude acid after it has passed into second hands.

It is said that the lower dilutions of crude acids are very freely used, and true carbolic acid has had to answer for the dissatisfaction caused by their use. Much is sold of it without explanation, and people being satisfied with the tarry smell, think they have used acid freely when really little genuine acid has been made use of. If these lower grades had never been used under the name of carbolic acid, the use of the true acid would be greater and its reputation better to-day. The lower grade acids are not imported into this country.

From the foregoing we find that carbolic acid is made in America that can well be depended on as a medicinal agent—that it can conscientiously be used in dispensing—and since the low grade acids are strictly American products, would it not be well to encourage the sale of the genuine acid, thereby not only doing the public a good service, but also encouraging the manufacturer by allowing him a further profit in con-

verting these inferior grades into pure crystal carbolic acid, in which there is much virtue.

ASSAYS OF COMMERCIAL ABSTRACTS.*

BY VIRGIL COBLENTZ, SPRINGFIELD, OHIO.

ABSTRACTUM IGNATIÆ.

This preparation, although almost a repetition of abstract nux vomica, is still retained in the category of abstracts; while still according to authorities it contains the alkaloids, though in widely variable proportions.

The complete extraction of ignatia, while presenting difficulties of a somewhat similar nature, yet in conjunction with the variable proportions of the alkaloids contained therein, as stated by authorities, will in all probability show us widely varying results.

In the estimation of total alkaloids, the methods applicable to nux vomica are equally as good for ignatia; that of Messrs. Dunstan and Short for assay of pharmaceutical preparations of nux vomica, slightly modified, was found accurate and quick: viz., 5 grams of the abstract was dissolved in 100cc. of dilute sulphuric acid, 2 of chloroform, and 2 of distilled water, and after slight warming, and perfect solution ensued, the entire product was transferred to separating funnel and shaken repeatedly with excess of ether, lastly with a mixture of ether and chloroform, until the ethereal liquids ceased to remove any further coloring or extractive matters. Messrs. Dunstan and Short remove the chloroform from the acid solution after the first agitation, then adding alkali and ether; this was not found to be sufficient, as further color and extractive were taken up on employing more ether and chloroform. An excess of liq. ammonia conc. was then added, and agitated with several portions of absolute ether containing chloroform. Three agitations were found sufficient for removing the entire amount of alkaloid from the solution. The residue was then dried on a water bath at low temperature until it ceased to lose weight.

After having obtained our alkaloid in as pure a form as possible, entirely free from color, the quantitative estimation of the amounts of strychnine and brucine then demanded attention.

Thus far several methods have been suggested, but *wanting* in results. The volumetric method with Mayer's reagent; same, by Mayer's improved (addition of two-thirds more KI); with potassium ferrocyanide, and Dr. Schweissinger's alkalimetric method, are the principal ones proposed.

* Presented at the Fifth Session.

Dr. A. B. Lyons has given us some valuable results of his work on the method with Mayer's reagent, proving its inaccuracies (see Drug Circ., June, 1886).

However, desiring to give them all a trial, and to append their comparative results, I experimented with each in turn.

Samples of neutral alkaloids, strychnine, and brucine, were obtained and examined, to be *assured* of the absence of impurities, and contaminations of one with the other.

0.500 grains of neutral alkaloid strychnine (anhydrous) was dissolved in 200 cc. of distilled water, with addition of sufficient tartaric acid to make solution; the resulting solution being almost neutral.

A definite number of cc. of the strychnine solution were measured into the beaker (in some cases diluted with water), and Mayer's solution dropped in from burette until precipitation ceased. Vigorous stirring assisted the separation of the precipitate, and as soon as the supernatant solution was clear, a drop of *either* solution was added until further turbidity ceased. Should the presence of a slight excess of Mayer's solution be suspected, a few drops of the volumetric solution of strychnine should be added; in case it produced a white precipitate, the addition of the strychnine solution should be continued, until turbidity ceased on further addition.

According to our dilution, each cc. of the solution strychnine contained 0.0025 grams of the alkaloid.

Dilutions from 1 in 200 to 1 in 500.

I.		Equivalent.	
10 cc.	strychnine solution (.025 gm.)	required	1.65 cc. Mayer's solution.
13.1 cc.	" " (.03275 gm.)	"	2.00 cc. " "
11.6 cc.	" " (.0290 gm.)	"	1.70 cc. " "
29.5 cc.	" " (.07375 gm.)	"	4.60 cc. " "
18.8 cc.	" " (.0470 gm.)	"	3.00 cc. " "
18.8 cc.	" " (.0470 gm.)	"	3.00 cc. " "

Then 1 cc. of the Mayer's solution precipitates .0151—.0163—.0170—.0160—.0156—.0156 grams of strychnine.

Also a quantity of alkaloid which *should* have required 6 cc. of reagent, according to Mayer, required 6.0—6.5—6.8—6.4—6.2—6.2 cubic centimeters.

The variation of these results was largely influenced by the dilution of the solution. The two latter assays were made with solutions of *same* strength and under same conditions; when diluted largely, the results differed widely.

II. The same strength strychnine solution was made strongly acid with either sulphuric or tartaric acid, and titrated same as above. 1 cc. Mayer's solution precipitates 0.0166—0.0139—0.0191—0.0206. The

quantity of alkaloid which should have required 6 cc. Mayer's solution, required from 5.5 to 8.2 cc., the results varying according to the excess of acid present. Under such like conditions the results *are of no value*.

III. Same strength solution strychnine (1 in 400) from nearly neutral solution was titrated by Mayer's solution modified (*i. e.*, containing two-thirds more KI).

	Equiv. Amt.				
Diluted 1 to 800 . .	{ 16.2 cc. sol. strychnine (0.0405)	required	2.5 cc.	M. sol. mod.	
	{ 22.5 cc. " (0.05625)	"	3.6 cc.	"	
Diluted 1 to 400 . .	{ 23 cc. " (0.0575)	"	3.5 cc.	"	
	{ 11 cc. " (0.0275)	"	1.7 cc.	"	
	15 cc. " (0.0375)	"	2.2 cc.	"	
	20.3 cc. " (0.05075)	"	3.1 cc.	"	
Strong Acid Solution {	10 cc. " (0.0250)	"	1.5 cc.	"	
	21.8 cc. " (0.0545)	"	3.3 cc.	"	

Then, 1 cc. of Mayer's modified solution is equivalent to 0.0162—0.0156—0.0164—0.0161—0.0170—0.0163—0.0166—0.0165 grams alkaloid. A quantity of alkaloid which *should* have required 6 cc. Mayer's solution modified, required 6.40—6.24—6.55—6.44—6.80—6.50—6.60 cubic centimetres.

The end of precipitation in case of employment of Mayer's modified solution was more marked, and separation of the precipitate was more rapid, than in case of Mayer's solution itself.

Upon the whole, the work and results are more satisfactory and are less influenced by dilution and acidity than Mayer's solution itself.

Still, in either case the results are so *variable* and subjected to so many influencing *conditions* that they are of *no value*.

BRUCINE.

A solution of 1 part of brucine in 400 of distilled water was made, with addition of sufficient dilute sulphuric acid to accomplish solution.

The operation was carried on in same manner as the strychnine solution. During the titration the solution was slightly warmed, which facilitated the separation of the precipitate, causing the solution to clear up rapidly, and enabling the operator to readily note the termination of precipitation.

The amount of acid present did not produce any appreciable difference in results.

I. MAYER'S SOLUTION.

	Equiv. Amt.				
36 cc. brucine solution (0.090)	required	4.6 cc.	Mayer's solution.		
27 cc. " (0.0675)	"	3.5 cc.	"		
10.8 cc. " (0.027)	"	1.9 cc.	"		
28.2 cc. " (0.0705)	"	3.6 cc.	"		
40 cc. " (0.100)	"	7.4 cc.	"		

Then 1 cubic cent. of the modified solution precipitates 0.0195—0.0192—0.0143—0.0195, and 0.0135 gms. of brucine.

II. MAYER'S MODIFIED SOLUTION ($\frac{2}{3}$ MORE KI.)

Equiv. Amt.

11.7 cc. brucine solution (0.0292)	required 1.5 cc. Mayer's solution, modified.
10.8 cc. " (0.0270)	" 1.4 cc. "
40 cc. " (0.100)	" 5.5 cc. "
18.2 cc. " (0.0455)	" 2.3 cc. "

Then 1 cubic cent. of Mayer's modified solution precipitates 0.0194—0.0192—0.0181—0.0197.

The result of the work of Mayer's modified solution, while a little more uniform than that of Mayer's solution itself, varies too greatly for such as quantitative work demands.

In the above titrations the amount of fluid in the solution was varied considerably, and the greater the variation the greater the discrepancy in the results obtained. If equal amounts of brucine solutions were operated upon (both being alike in acidity), the results obtained are reasonably close; but when it is to be applied under different conditions, as would be necessary, it becomes entirely useless.

In the employment of the modified Mayer's reagent, the end of the reaction is more readily determined than in that of Mayer's solution itself, and hence this may account for the closer results in the employment of the modified reagent, as in the old Mayer's solution it requires considerable caution to determine just when the precipitation should be called complete.

Upon the whole, the employment of Mayer's solution, or its modification, in the estimation of strychnine, is subject to too many variations and conditions to permit of its employment in the quantitative estimation of either strychnine or brucine.

The method recommended by Messrs. Dunstan and Short, which consists in the precipitation of the strychnine from acid solution with potassium ferrocyanide, was given a trial. It was attempted to apply it volumetrically, as well as gravimetrically. In weak solutions of either strychnine or brucine, after the addition of a normal solution of potassium ferrocyanide, the alkaloid separated very slowly in a white, granular-like, crystalline form. When employed volumetrically, it was found that unless both the ferrocyanide and strychnine were very strong, precipitation was very indistinct and slow forming; the end of the reaction would then be a very difficult matter to determine, as a decided excess of either solution might be added before the separation of a precipitation might be noticed, which especially as the end of the reaction draws near becomes slower and less distinct. The precipitate when carefully collected, washed, dried and weighed, admitted of very close results. It was neces-

sary to add dilute sulphuric acid from time to time during the precipitation to retain strong acidity, which is so essential to prompt precipitation of the strychnine. A slight excess of the ferrocyanide solution is essential in order to be assured of sufficient reagent for the entire precipitation of the alkaloid. To insure accuracy of results, the operation must be closely watched to avoid losses, and a balance (accurate) must be at hand. In considering the means and wants of the pharmacist, this process would not be admissible, as it will not permit of rapid and close work, without the constant use of a balance. The following process (alkalimetric), as proposed by Dr. Schweissinger, fulfills these wants. He employs decinormal acid (HCl), and decinormal alkali (NaOH). One cubic centimeter (.003637) of decinormal acid neutralizes 0.00394 grams brucine and 0.00334 grams strychnine. The mixed alkaloids are weighed into a beaker, dissolved in slight excess of the decinormal HCl, noting the exact amount employed. Litmus is used as indicator. The solution is then carefully titrated back to neutrality with the decinormal alkali. The number of cc. of alkali employed is subtracted from the cc. of acid taken. The weight of alkaloid in milligrams is divided by this difference (giving number of cc. of decinormal acid required to neutralize); subtract the quotient from 3.94, divide the remainder by 6, and the quotient after removing the decimal point 3 places to the right will be the percent. of strychnine in the mixture. The brucine may be found then by difference (provided the product is free from foreign matters, as color and extractive). This method of estimation was first applied to estimation of strychnine and brucine separately, in order to ascertain the accuracy of the results.

The decinormal solutions of NaOH and HCl were carefully prepared (1 cc. of the decinormal HCl exactly neutralizing 1 cc. of the NaOH). The amounts of neutral alkaloid strychnine were carefully weighed out into a capsule, then slight excess of decinormal HCl run into it; as soon as the strychnine was dissolved, solution litmus was added, and the excess of acid was titrated back by decinormal alkali.

Strychnine	0.050	{ Acid = 22.15 Alkali = 7.19	Difference = 14.96 cc.
"	0.0105	{ Acid = 35.50 Alkali = 32.36	Difference = 3.14 cc.
"	0.0075	{ Acid = 17.28 Alkali = 15.04	Difference = 2.24 cc.
"	0.050	{ Acid = 25.59 Alkali = 14.99	Difference = 10.60 cc.
"	0.0105	{ Acid = 21.50 Alkali = 18.33	Difference = 3.17 cc.
"	0.0064	{ Acid = 16.30 Alkali = 14.40	Difference = 1.90 cc.

Since each cubic centimeter of the decinormal acid is equivalent to 0.00334 gms. strychnine, then

0.050	gm.	Strychnine taken	yield by estimation	0.0499	gms. alkaloid.
0.0105	"	"	"	0.01048	"
0.0075	"	"	"	0.0074	"
0.050	"	"	"	0.050	"
0.0105	"	"	"	0.0105	"
0.0064	"	"	"	0.0063	"

The results will be found to be reasonably accurate for quantitative work. Still closer results might be obtained if the solutions are weighed instead of measured.

Brucine was operated upon in same manner as strychnine: 1 cubic centimeter of decinormal acid=0.00394 gms. brucine.

Brucine	0.018	{ Acid =26.51 Alkali=21.95	Difference=4.56 cc.
"	0.0207	{ Acid =29.50 Alkali=24.25	Difference=5.25 cc.
"	0.0106	{ Acid =20.19 Alkali=17.50	Difference=2.69 cc.
"	0.0218	{ Acid =39.00 Alkali=33.48	Difference=5.52 cc.
"	0.0048	{ Acid =10.73 Alkali= 9.52	Difference=1.21 cc.

Since one cubic centimeter of decinor. acid=0.00394 brucine

Then 0.018 gms. taken yielded=0.0179

Then 0.0207 gms. taken yielded=0.0206

Then 0.0106 gms. taken yielded=0.0105

Then 0.0218 gms. taken yielded=0.0217

Then 0.0048 gms. taken yielded=0.0047

Mixtures of brucine and strychnine were then tried and subjected to same treatment as above, the per cent. and amount of strychnine being calculated as given above, the brucine being obtained by difference.

EXAMPLES.

Strychnine=.250 } Decinor. Sol. HCl= 30.00 cc.

Brucine= .250 } Decinor. Sol. NaOH=16.26 cc. Difference=13.74 cc.

Weight of Alkaloid $500 \div 13.74 = 3.639$.

$3.940 - 3.639 = .3010$.

$0.3010 \div 6 = 50.17$ Strychnine.

It will be noticed that the larger the amounts of alkaloid operated upon, the *closer* the results.

Strychnine = 0.100 } Decinormal solution HCl = 20.00 cc. } Difference = 5.49 cc.
Brucine = 0.100 } " " NaOH = 14.50 cc. }

Amt. alk'd $.200 \div 5.49 = 3.642$.

$3.94 - 3.642 = 0.2980$.

$0.2980 \div 6 = 0.0496 = 49.6 +$ per cent. strychnine.

It will be seen from results below, that in smaller amounts of total alkaloids, weighing the solutions will yield us results much closer than the above. Five estimations of a mixture of 1 decigram each of strychnine and brucine, gave an average difference of 5.49 cc. 1% NHCl , equivalent to 49.6% strychnine. One estimation was made, employing 0.100 each of strychnine and brucine, weighing the amounts of decinormal acid and alkali. 20.00 gms. of decinormal HCl — 14.506 decinormal NaOH = 5.494 gms. of decinormal HCl , required to neutralize the alkaloids.

$$200 \text{ (alkaloids in mg.)} \div 5.494 = 3.6400. \quad \begin{array}{r} 3.940 \\ 3.600 \\ \hline .3000 \div 6 = 50.0 \% \end{array}$$

corresponding to .100 strychnine, the difference giving brucine, which is 0.100.

Five estimations of mixtures of .250 gms. each brucine and strychnine, gave an average difference of 13.73 cc. decinormal HCl , equivalent to 50.1% strychnine.

Three estimations of mixture of 0.525 grams each of brucine and strychnine, gave an average difference of 28.85 cc. decinormal HCl , equivalent to 50% strychnine.

In working large amounts (above 1 decigram) measuring gives us all that we can desire for accurate work. However, at and below this amount, the decinormal acid and alkali should be carefully weighed, and as advised by Dr. Lyons, will admit of extremely close and exact work. But for rapid and practical work, for pharmacists who may desire to estimate their products, measurement is reasonably accurate.

RESULTS.

	Total alk'ds.	Strychnine.		Brucine.
No. 1 . . . 5 gms.	= 0.237	= 0.1813 gms.	57.1 %	0.0557 gms.
No. 2 . . . 5 gms.	= 0.209	= 0.1192 gms.	57.06 %	0.090 gms.
No. 3 . . . 5 gms.	= 0.222	= 0.1295 gms.	58.6 %	0.0924 gms.
No. 4 . . . 5 gms.	= 0.194	= 0.1068 gms.	55.1 %	0.0872 gms.
No. 5 . . . 5 gms.	= 0.218	= 0.1262 gms.	57.9 %	0.0918 gms.

ABSTRACTUM PODOPHYLLI.

As is well known, the variation of the quality of this drug depends upon the amount of resin yielded. The poorer the quality, the less the amount of resin present, hence to judge the galenical preparations of this drug we may apply the same method.

5 grams of each abstract was weighed and digested in a flask with excess of alcohol (U. S. P.), filtered, and flask and residue washed with further amount of alcohol, until filtrate ceased to give any turbidity when dropped into water. The filtrate and washings were concentrated and

poured into excess of distilled water (containing small per cent. of HCl), allowed to stand and separate, then filtered into counterbalanced filters, washed slightly, and dried in oven at low temperature till it ceased to lose weight. Each sample was assayed twice, and if results were close, the average was taken.

	Resin.	Per cent. in Abstract.	Corresponding per cent. in drug.
No. 1. 5 grams	0.596	11.5	5.9
No. 2. 5 "	0.463	9.2+	4.6
No. 3. 5 "	0.325	6.5	3.2
No. 4. 5 "	0.517	10.3+	5.1
No. 5. 5 "	0.377	7.5+	3.7

The average yield of resin from the drug varies from 4 to 5%, making the average of the abstract amount to from 8 to 10%. It will be observed that our samples are within a very reasonable limit, considering the variable quality of the drug that may be found in the market.

ABSTRACTUM VALERIANÆ.

To judge the comparative quality of a preparation of valerian, wherein the process of manufacture is liable to be carried on to the loss of much of its sensible medicinal properties, is very unsatisfactory; as the medicinal value of valerian resides in the volatile oil and valerianic acid, and these are so readily altered by heat, that to examine the preparations for these principles is a matter beyond the time of the operator. As the extractum valerianæ has been and is still employed in practice as a representative of the drug (though a poor one), we were content to judge the comparative quality by the amount of soluble extractive contained in the abstract.

Five grams of the abstract was weighed into a flask and allowed to macerate with excess of alcohol (U. S. P.), then filtered, and residue washed with strong alcohol till filtrate ceased to leave any visible residue when evaporated upon watch-glass. The amount of sugar of milk taken up by the strong alcohol was very small. The alcoholic filtrates were evaporated at low temperature on water-bath until they ceased to lose weight.

RESULTS.

No. 1 = 5 grams = 1.055 extract (grams) = 10.5% in drug.
No. 2 = 5 " = 1.170 " " = 11.7% "
No. 3 = 5 " = 0.930 " " = 9.3% "
No. 4 = 5 " = 1.109 " " = 11.1% "
No. 5 = 5 " = 1.092 " " = 10.9% "

The amount of extractive yielded by valerian, seems, according to authorities, to vary considerably. Dr. Squibb states that he obtained solid extract equal to 9.2% of the valerian root represented; other authorities

state the amount to be as high as 20%. The difference in the alcoholic strength of menstruum employed, probably accounts in main part for the different results.

ABSTRACTUM SENEGÆ.

Pharmaceutical preparations of this drug are best judged by their acrimony, which is undoubtedly *mainly* due to the polygalic acid residing chiefly in the cortical portion of the drug. According to Procter, the drug contains $5\frac{1}{2}$ % of polygalic acid, thus allowing about 10 % to 12 % in the abstract if made from an average drug. The process of separation followed is that recommended by Procter, which is as follows (the exhaustion of drug is supplanted by that of abstract): The abstract was macerated and exhausted with a mixture of 2 parts alcohol to 1 of water, the filtrate evaporated till the alcohol was driven off, the aqueous solution was transferred to a separator and repeatedly agitated with several portions of absolute ether until the latter ceased to acquire color, the syrupy liquid was mixed with 3 parts of alcohol, then $1\frac{1}{2}$ parts ether, well agitated and set aside to repose. The polygalic acid being nearly insoluble in this menstruum, precipitates as a light fawn-colored precipitate. All the acid was known to be precipitated, as the filtrate ceased to precipitate on being added to the mixture of alcohol and ether. The supernatant liquid was decanted from the precipitate, the balance was thrown on to a counterbalanced filter, dried and weighed. The acid still contained traces of coloring matter. It was dissolved in a small amount of hot water, added to alcohol and ether, again filtered, dried and weighed.

RESULTS.

Abstract 5 grams = Polygalic Acid = per cent. in drug.

"	5	"	=	0.479 grams	=	4.79.
"	5	"	=	0.503 "	=	5.03.
"	5	"	=	0.425 "	=	4.25.
"	5	"	=	0.340 "	=	3.40.
"	5	"	=	0.497 "	=	4.97.

These average reasonably good.

ABSTRACTUM BELLADONNÆ.

Five grams of abstract was weighed into flask and digested with 25 to 30 cc. distilled water acidulated with hydrochloric acid, then thrown on to filter, the flask and residue washed with acidulated water until filtrate ceased to give reaction with alkaloid reagent (I in KI). Care was taken to avoid the employment of any larger amount of the aqueous liquid than necessary, thus obviating the prolonged application of heat (necessary to concentration), which might be the cause of the decomposition of the alkaloids. The acid liquid was washed with chloroform to remove portion of color, then slight excess of ammonium hydrate was added, dissolv-

ing out the alkaloid with chloroform; shaking the chloroform solution with double its volume of acidulated water, separating the aqueous alkaloidal solution and again treating it with excess of ammonia and agitating with several portions of chloroform to thoroughly remove all traces of alkaloid. The chloroform solutions were evaporated and dried at low temperature until it ceased to lose weight. (This method is that recommended by Dunstan and Ransom.) The residue was entirely free from color and extractive.

RESULTS.

No. 1.	5 grams	=	0.051 gm. alkaloid	—	correspond to	.51 %	in drug.
No. 2.	5 “	=	0.054 “	—	“	.54 %	“
No. 3.	5 “	=	0.068 “	—	“	.68 %	“
No. 4.	5 “	=	0.041 “	—	“	.41 %	“
No. 5.	5 “	=	0.059 “	—	“	.59 %	“

Our samples of belladonna will be seen to be very uniform, and all that could be desired.

The remaining abstracts of conium, hyoscyamus and digitalis, I was unable to reach.

Judging these as far as we have gone, we will have undoubtedly observed that the largest majority of manufacturers turn out products which represent a carefully prepared article, made from an average well-selected drug. In a few cases where there is much variation, it may be accounted for in the troublesome and difficult character of the drug to be worked. In drugs of the tough and horny nature, and that present difficulties of thorough exhaustion, like *ignatia* and *nux vomica*, there is some excuse for variations. Still, on the other hand, in the balance of the abstracts, the drugs employed are easy of exhaustion and procurable in abundance; variation in this case is due to careless selection, or incomplete exhaustion of the drug, and there is no excuse whatever.

I have made comparisons wherever necessary, and readers can draw their own conclusions. It is not in place here to dwell upon the popularity or unpopularity of this class of preparations, as able writers have already demonstrated this point; we only attempt to judge how near, or how well, they fulfill their intended conditions pharmaceutically. Time *may* bring popularity: whether or not they continue to merit the confidence of the trade, remains with the integrity of the manufacturer. Thus far, the largest majority of them have fulfilled these conditions fully up to the standards of requirements.

A STUDY OF PEPTONIZATION.*

BY R. G. ECCLES, M. D.

Among physiologists and chemists, the conversion of albumen and syntonin into peptones has been a subject of careful study during late years. A great deal of valuable information has been given thereon by such workers as Finkler, Meissner, Rossbach, Stutzer, Kühne, Schützenberger, Henninger, and others. Questions of practical interest to pharmacists have received but passing notice, and as a result the profession has advanced only a little beyond its position of ten years ago in this branch of knowledge. Peptonized foods for babies and invalids are being multiplied by manufacturing pharmacists; elixirs of pepsin in many combinations are pressed upon the market as aids to digestion; wines of pepsin, pills of pepsin, and a host of powders, scales, and so-called crystals of pepsin, enter into vast numbers of prescriptions daily put up in every pharmacy in the country. Many customers come and buy these articles on the recommendation of friends, for some fancied digestive ailment, or in real cases of functional gastric disturbance. The dispenser must be prepared to answer numberless questions about the best method of using them internally, or for peptonizing foods before taking, and about their compatibles, incompatibles and synergists. There are limits of safety and points of danger to all remedies, even the apparently harmless, and these can only be known after careful investigation.

It may turn out that there will be a necessity for calling a halt to some of our enterprising manufacturers in the class of goods we are considering, when some important facts hitherto but little noted are better known. Tests for the identification of the products of artificial digestion may yet show that so-called peptonized foods are worse than no foods at all for sickly stomachs. We have hitherto supposed that peptone was peptone, but we are now discovering that there are peptones and peptones. Some of them too are very far from wholesome. We need more knowledge upon the effects of temperature upon artificial digestion, both as to its speed at various points and the alteration of products at those points.

We want to know what effect remedies will have that are combined with digestive ferments, upon the products of such digestion and the quantity. We will find it to our advantage to be able to tell whether other acids than hydrochloric can peptonize albumen in the presence of pepsin. If they can, what are they, and how do they compare in power with the one named? Does it matter what strength of acid is used, or does it vary in power with different degrees? What are the most and

* Read at the Third Session.

least favorable percentages with which to work? Will a combination of these acids work as well or better than a single one? Our American and English pharmaceutical literature seem to contain very little information on these points.

Hoping to be able to clear up a little of the haze, the investigations whose results are embodied in this paper were begun. In Reichert's Foster's Physiology, p. 962, a description is given of the peptones, with methods for distinguishing them from other proteids. In some things it is correct; in others it seems to disagree with the facts. All peptones are declared to be soluble in water, when at least one kind is not, as pointed out by the same author elsewhere. In my experience, plumbic acetate will not precipitate peptones in acid solutions, and during these investigations a production of the same in large amount has occurred in the presence of this salt. Foster declares that both acetates of lead throw them out of solution, and Watt's Dictionary of Chemistry, Supp. 1872, p. 974, makes a similar statement. What would occur in a neutral solution I cannot say.

Peptones are not coagulable by alcohol, nor does boiling affect their power of rotating a beam of polarized light, as is the case with other proteids. According to the last authority quoted, on page 975, the percentage composition of peptone and albumen are as follows:

	Carbon.	Hydrogen.	Nitrogen.	Oxygen.	Sulphur.
Peptone.	50.87	7.03	16.34	24.12	1.64
Albumen	51.37	7.13	19.00	23.12	2.12

These figures present a formidable appearance to any chemist anxious to seek a rational formula or explanation of the change. For some time to come we must be content with empiric knowledge here. When a few drops of Fehling's solution are added to a solution of peptone, a beautiful red color like that of alkaline phenol-phthalein appears. By adding plenty of potassic hydrate with a trace of cupric sulphate to a solution of peptone, we get the same color reaction. An excess of the cupric salt gives violet. All acids alter the red color; some completely dispel it. Tannic acid changes it to a yellowish, and then reddish brown, according to the amount used. Gallic acid produces a brown or greenish brown. Picric acid in somewhat concentrated solution gives an amber brown, and in dilute a yellow. Phenol gives a muddy lilac. Mercuric chloride discharges all color. Potassium ferrocyanide gives a clear, dark wine color, that continues even when made acid, except in a goodly proportion of hydrochloric, when a brown precipitate falls, leaving the hue less intense. No reagent could be found that would completely precipitate all the peptone from a solution. With the best of them it would retain its foaminess on agitation, and with most of them give the red color with Fehling's solution.

The following substances throw down part of the peptone: Mayer's solution, chlorine, chloride of sodium, iodine, nitrate of silver, nitrate of mercury (the last two in the absence of chlorides), platinic chloride, perchloric acid, potassium acid chromate, potassium ferrocyanide, and cadmium iodide. All of these precipitates are speedily dissolved upon the addition of an alkali in proper quantity. Most of them are white. One or two are yellow or yellowish red.

The most complete precipitation occurs in the presence of sodio-hydric molybdate, or else the neutral or disodic molybdate. These throw down a very copious white precipitate immediately on being added. If this precipitate is shaken up with chloroform, a thick, pasty emulsion results, partly soluble in ammonia with a light blue color. Benzin forms a thinner emulsion with a yellowish tinge that is completely soluble in ammonia with a light blue color. This color is probably due to the molybdenum, and not the peptone. In the presence of methyl alcohol the molybdate of sodium precipitate has a straw yellow color, likewise soluble in ammonia with a blue appearance. All these peptones precipitated by molybdate of sodium are soluble in boiling water and boiling alcohol, but not in boiling ether. They are only partially soluble in cold water or alcohol, but very soluble in alkaline solutions. Many samples of pepsin are partly or wholly precipitated from solutions by molybdate of sodium. Whether this is due to the presence of peptones or is really a precipitation of the pepsin itself is unknown, a lack of time forbidding further investigation in this direction. When potassium citrate or acetate is present, molybdate of sodium produces no precipitation of dissolved peptones. These two salts, however, throw down part of the peptone themselves. A very dilute solution of peptones in the presence of citrate of bismuth failed to show even a trace of milkiness on the addition of sodium molybdate, while it promptly gave the red color with Fehling's solution.

Where a worker is not stinted for time, this chemical side of the subject is especially captivating, even though but little practical headway is gained. The consciousness of seeing and discovering facts never before witnessed is a *dirigo motor*. When hurried, however, by a multitude of considerations of more pressing importance, everything is done in a quick, incomplete manner. Every reaction here enumerated bristles all over with imaginary interrogation points, to seek replies to any one of which would consume much valuable time.

After discovering ways and means for detecting peptones and distinguishing between them and other proteids, it became necessary to separate these into two kinds, or what may yet prove to be two groups. Meissner distinguishes them as peptones and parapeptones, while Kühne calls them antialbumose and antialbumate. The first is the representative of true digestion and the last a deceptive, injurious product of semi-digestion,

which unfortunately cannot reach complete digestion except by the aid of trypsin. This ferment converts it into leucin and tyrosin, and then into true peptone. (Reichert's Foster's Physiology, p. 964.)

True peptone we find to be soluble in alkaline, acid, and neutral solutions, while parapeptone is precipitated in neutral solutions as declared by its discoverers. Chloride of sodium precipitates it from even acid solutions in connection with some peptone and pepsin. Prof. Scheffer some years ago showed that such a precipitate had good digestive qualities, without the addition of farther pepsin. He found that one grain of it in one ounce of water would dissolve one hundred grains of albumen in six hours. London Pharm. Jour. and Trans. (3), Vol. 3, p. 784.

We next turned our attention to the production of peptones. With the same pepsin various experimenters seem always to reach results of exceedingly variable character. In the very nature of the thing, some difference must be found, but there should be no direct contradiction. Muriatic acid is the one generally used. As this varies considerably in strength as found in different pharmacies, and as care is seldom taken to assay it before using, it seemed reasonable to suppose that such variation might have something to do with this lack of uniformity. Acidum hydrochloricum of the United States Pharmacopœia contains 31.9 per cent. of absolute hydrochloric acid. This is a most awkward proportion to calculate from, even if you are sure of the article you use. If it could only be fixed at 25 or 30 per cent., it would certainly be a great blessing. We might then be able to have a ten per cent. dilute acid, which the Pharmacopœia aims at having, but does not secure.

To discover what effect a variation in the strength of acid has upon digestion, five grams of finely ground albumen, ten centigrams of pure pepsin, dilute hydrochloric acid of the per cent. of absolute HCl given, and water enough to make fifty cubic centimeters for each, were placed in two-ounce bottles, exposed to a temperature of 38° to 40°C. (98° to 100° F.) for one hour and a half in a water oven, where they were shaken every ten minutes. As soon as taken out they were suddenly cooled, contents passed through pairs of equal weight filters, dried to constant weight, filters separated and counterpoised upon opposite scale pans and weight registered to milligrams. (Every milligram found was taken to represent six and three fourths milligrams, this being the mean result of six experiments with weighed quantities of fresh albumen after drying.) Such as blocked the filter had their excess of solution absorbed by bibulous paper, care being taken to see that no albumen was carried off. The table gives the amount of undissolved albumen to centigrams, the odd milligrams being dropped after multiplying the dry product by six and three-fourths:

% HCl	1.	.9	.8	.7	.6	.5	.4	.3	.2	.1	.05
Albumen undissolved . . .	.80	.70	.55	.40	.17	.10	.05	.00	.00	.30	1.41

You will observe by these figures that .3 % and .2 % come out even, having dissolved all their albumen, and that from this point there is a steady decrease in digestive power all the way up to one per cent.

Below 2 per cent. the decrease in power of digestion, instead of resembling an inclined plane as it does above, goes *per saltum*. The leap at a single halving is almost as great as at the fourth doubling.

The question now arose as to the equality in power of .3 and .2 per cent. To settle this a new trial was made, in which all the conditions of the other were retained, except that the time was reduced to half an hour, and the quantity of pepsin to 5 centigrams. Here are the new results:

% HCl	.5	.4	.3	.2	.1
Albumen undissolved . .	.75	.60	.45	.20	1.36

This fixed the best proportion at .2 per cent., showed the same steady rise in the undissolved albumen as the acid increased, and the sudden leap made as it diminished from the same point. It is evident then that a very little acid more or less in any two experiments is going to make a marked contrast in the results, even with the same pepsin.

It might be added in this connection that in all these experiments but one brand of pepsin was used, up to the time that the commercial samples came under consideration. In a number of preliminary trials Fairchild's proved the best, and was the kind in constant use. Subsequently another brand came out ahead.

The next problem to solve was in relation to other acids than muriatic. Do they possess digestive power? Expecting to test them of various strengths, from one per cent. downward, in the preliminary trial, the largest proportion was used. Seven acids were first put to the test, but later on others came in for trial. These were muriatic as a control, phosphoric, lactic, nitro-muriatic, nitric, acetic, and sulphuric. Ten centigrams of pepsin was used for each, and all other conditions maintained as before, except that the time was prolonged to five hours. Phosphoric acid was the only one that gave complete solution. Muriatic was almost complete, a mere trace only remaining undissolved. Of the lactic acid sample nearly half a gram was left, while those of nitric and nitro-muriatic gave each a remainder of nearly a gram and a half. Sulphuric acid left over four-fifths of the total five grams, and the acetic acid one made the worst record of all, by only dissolving about half a gram, and leaving a little over four and a half grams.

This seemed to indicate that acids generally must possess peptonizing power, and of this group, phosphoric led at one per cent. But does it lead of all other strengths? This was an important matter to know, especially as it had finished its work long before the five hours were up. To set the matter at rest, a new set of experiments were now prepared,

containing various per cents. of phosphoric acid. The time was reduced to two hours, and the pepsin to two and a half centigrams. All other conditions were as before described.

% H_3PO_4	1.	.9	.8	.7	.6	.5	.4	.3	.2	.1
Albumen undissolved	.00	.03	.05	.08	.12	.26	.30	.71	.93	2.36

The behavior of this acid is quite unlike hydrochloric in respect to this power. Hasty *a priori* conclusions from the preceding table would certainly have led into error. Here we have a steady increase of power up to one per cent. Whether this is or is not its maximum, it would be idle to speculate, and we were forced to hurry past without interrogating nature upon the matter. Other acids were in turn put to the same test, with the following results :

Acid, %	1.	.8	.6	.5	.3	.2	.1
Nitric.	2.27	1.93	1.57	1.41	.60	.71	1.89
Sulphuric	2.31	2.87	2.98	3.16	3.27	3.34	3.74
Nitro-Muriatic . .	2.10	1.34	.31	.20	.00	.21	3.91
Hydro-Bromic . . .	2.96	2.84	2.24	1.48	.41	.16	.39
Acetic	5.00	4.60	3.52	3.19	2.93	3.04	3.11
Tartaric.	.39	1.29	1.82	1.96	3.08	3.75	3.93
Citric.	1.47	2.22	2.50	2.71	3.73	3.92	4.06
Lactic	.35	1.31	1.89	2.16	3.19	3.90	4.15
Hydrocyanic. . . .	. .	. .	5.00	5.00	4.87	4.01	. .
Hyperchloric . . .	2.65	. .	. .	3.17	4.79	5.00	. .

The first line of figures is the per cent of acid used in the experiments of the column below it. The first column is the name of the acid used in all experiments on a line with itself. The columns of figures are the grams and fractions thereof of albumen undissolved after two hours exposure with two and a half centigrams of pepsin, all other conditions being as before described. Nitro muriatic acid, leads this list, and .3 per cent. is its most favorable strength. Hydrobromic comes next with .2 per cent. as its most favorable proportion. Tartaric and lactic acids seem to possess very nearly the same digestive power, and both of them, like phosphoric, ascend in power up to one per cent. Citric comes next in power, but acetic dissolved no albumen at one per cent., and reached its maximum at .2 per cent. It is a very poor acid for the purpose at any strength. Hydrocyanic acid was a surprise in that it dissolved any at all.

Thinking it of interest to determine the effect of a mixture of phosphoric and hydrochloric acids, a trial of these was made in a variety of proportions. With .5 per cent. of the former to .4 per cent of the latter there was considerable hindrance of digestion. With .4 per cent. phosphoric to .2 per cent muriatic, and with .7 per cent. phosphoric to .2

muriatic there was no hindrance. The same was true of .8 per cent. phosphoric to .1 per cent. muriatic. With .6 per cent. as well as .8 per cent of the former to .2 per cent of the latter, a slight gain was made over the control experiment with only .2 per cent. muriatic. Phosphoric acid is therefore a decided aid to digestion. This no doubt accounts for the rapid popularity into which acid phosphate has leaped within a few years.

Now came the important problem of temperature. That of the stomach, 38° to 40° C. (98° to 100° F.), has all along been considered the best. But is it so? For the stomach itself no doubt it is. For rapid work in testing samples of pepsin it may not be. In all the experiments to determine this point, hydrochloric acid, .2 per cent., and 5 centigrams of pepsin were used. Other conditions, except those of varying temperature, and the fact that everything used was raised to the required degree of heat before the pepsin was added, remained as heretofore described:

Degrees Centigrade.	40° .	44° .	49° .	55° .	60° .	66° .	82° .
Per cent. HCl.							
.5	.10	.08	.07	.00	.08	.25	
.4	.05	.00	.00	.00	.00	.13	
.3	.00	.00	.00	.00	.00	.09	2.17
.2	.00	.00	.00	.00	.00	.00	1.09
.1	.30	.26	.20	.14	.18	.36	

At 82° C. (180° F.), the bottles were found too hot to handle more than a pair of them. The first line of figures are those of temperature, and the first column is the per cent. of hydrochloric acid. The other columns represent the undissolved albumen at the temperature above and per cent. acid at the side. A glance at the figures reveals the fact that 55° C. (130° F.) or perhaps somewhere between it and 49° C. (120° F.) is the best dissolving temperature. Had less pepsin been used and the time shortened, it could have been fixed more closely. At 82° C. (180° F.) there was a very great falling off in power, and the product was nearly all precipitable upon neutralization. This showed that para- and not true peptone had been formed. The amount of the pseudo product seemed to increase steadily with the rise of temperature.

Last spring, having some pills of pepsin with reduced iron to examine for the New York State Pharmaceutical Association's Committee on Adulterations, it was discovered that so far as digestive power was concerned, they were totally inert. Surprised at this result, the question at once arose, "Does reduced iron destroy the power of pepsin?" Proceeding at once to ascertain the fact, it was found that in amounts of 75 or more centigrams to 50 cc. of the usual digestive mixture, the pepsin became absolutely worthless, no matter how good it may before have been. Proceeding upon this suggestion, a few more substances were tried, and work

finally laid out for a large number of experiments covering the most frequently prescribed officinal and non-officinal drugs. While the task thus allotted was laid at rest for a spell, the London "Lancet" of June 19, 1886, p. 1175, was placed before me by a friend. This decided me to hurry up the task. It related that Dr. Klikovich, of Russia, had published in the "Weekly Clinical Gazette" his report of a large number of experiments of this very kind, a synopsis of which was then submitted. His determinations of quantity were all made by calculating from the rotary power of a column of the solution of a definite thickness upon a beam of polarized light. His costly apparatus was made by Soleil, Wentzke and Lorant, celebrated scientific and optical instrument-makers. Both dried egg albumen and inspissated blood serum were used. His time of digestion was four to six hours.

If it were possible to always maintain every condition exactly the same in a long series of trials of this kind, such a delicate method of determining results would be admirable. When we consider that he used dried albumen, and protracted time with an indefinite limit of two hours, we see that his results must be subject to very great perturbation. When he tells us that the chlorides of sodium and potassium up to one per cent. of the total mixture possess little or no effect in retarding peptonization, our faith in costly polarizing apparatus gives way at once. With .1 per cent. a retardation sufficient to be observed occurs, and when it reaches 1 per cent., more than 10 per cent. of the albumen is undissolved, and a control experiment by its side, with all things alike except the presence of the salt, has come out all dissolved. With a half of one per cent. it took one bottle five hours to gain as complete solution as the control bottle did with all else alike in forty-five minutes. Here there were no filtering, drying and weighing, through which an error could creep in. In chloral hydrate his figures again disagree with those found in these experiments. With him .2 per cent. materially hindered digestion. Unless his decimal points have been altered in translating, it is hard to account for such results. With 2 grams of chloral in 50 cc. (*i. e.*, 2 per cent.) only 19 centigrams remained after one hour, and only two and a half centigrams of pepsin were used.

On bromide and iodide of potassium our results are practically alike. One-tenth per cent. shows retardation, and on reaching ten per cent. the amount of albumen undissolved in two hours is 2.42 grams and 1.47 grams respectively, out of a total of five grams. With reduced iron he points out the same fact, which first caused my attention to be turned toward this subject, but gives no reason therefor.

By a successive set of trials with acids of varying strength, it was my fortune to discover that the cause of so unexpected a result was its consumption of the acid, with perhaps the formation of ferric chloride. With a sufficient supply of acid to keep up the proper proportion during the

whole process, there is but little interference. His figures on alcohol are very nearly those found in this investigation. Very little interference is found until reaching about eight per cent. of the total, when it begins to display marked effects. He fixes it at ten per cent. This proves how ill founded are the prejudices possessed by some against wine of pepsin, and that caused it to be kept out of the 1880 Pharmacopœia, in spite of its popularity among physicians and the public.

When a wine containing twenty to twenty-five per cent. of alcohol is used and a dose of a tablespoonful administered, on dilution in the contents of the stomach there is far less than one per cent. This cannot possibly interfere in the least with the action of its contained pepsin. Even if it did, the alcohol would be apt to soon disappear and leave it as if none had been there. Prof. Scheffer first pointed out the retarding influence of alcohol on peptonization, but he seemed to draw wrong conclusions therefrom, so far as wine of pepsin is concerned. His papers upon the subject appeared in the "American Journal of Pharmacy" for 1870, and in the "London Pharmaceutical Journal" of the same year.

Mr. Coombs' experiment in last year's report ("Proceedings American Pharmaceutical Association," vol. 33, p. 355,) confirms the results here given, as well as those of Khlkovich, so far as wine of pepsin is concerned.

Either quinine and the other alkaloids of cinchona are not as important articles of the Russian Pharmacopœia as of our own, or certainly they would have been noticed by the Doctor in his investigations. With these quite a marked retardation results, and, as was discovered, from a similar cause to that of reduced iron. In gaining solution they seem to exhaust the acid of the mixture, just as much as if they really formed a new chemical compound in doing so. Some of them no doubt do. Muriate of quinine, when two per cent. of the total, and previously dissolved in extra muriatic acid, only retarded enough to leave thirteen centigrams undissolved after two hours. When put directly into the mixture without additional acid, there was left 2.31 grams, or nearly half the total five grams of albumen. Similar results occurred with the other salts of quinine. The sulphate, however, retards more than any of the others, whether with or without extra acid. The bromide has, on the other hand, the least retarding power.

All elixirs of quinine with pepsin should have an excess of acid, and if the difference in cost is of less importance than a truly efficient compound, the bromide with dilute hydrobromic, or the chloride with dilute hydrochloric acid, should be used. It is bad pharmacy to use the sulphate.

Many receipts for elixirs with pepsin contain citrate of bismuth and ammonia. Because the subnitrate and subcarbonate of bismuth have been found such excellent articles to combine with pepsin, and these being insoluble, they chose the citrate in their stead, supposing they

could be substituted for each other advantageously. This is a delusion. The excellent qualities of the two first are in a measure at once seen to be due to their not interfering in the least with pepsin digestion. The citrate has no such record. Two per cent. was all that was needed to cause 3.38 grams of albumen to remain undissolved at the end of the two hours. This is nearly three-fourths of the total.

All the salicylates except methyl check the action of pepsin very markedly. Salicylic acid does the same. Salicin, however, closely as it is related to the last article, has scarcely any bad influence upon digestion. Indeed, it almost seemed as if it was an aid rather than a hindrance, since it came out just ahead of the control experiment, when two per cent. Sugar has very little influence in ordinary quantities, but when fifty per cent. of U. S. simple syrup was used, twenty-seven centigrams remained undissolved when the two hours were up. Glycerin, when thirty per cent of the total, gave sixty-five centigrams, so that its influence is considerably greater than that of syrup. Chloroform when four per cent. caused nearly one-half the albumen to remain undissolved. All alkalies and alkaline salts are powerful retarders. Cathartic and "after-dinner" pills, two being used at a time, caused only a slight delay. They took fifteen minutes longer than the control-bottle to complete digestion. Fowler's and Donovan's solutions, much to my surprise, only left twenty centigrams, when two per cent. of the total. Monobromated camphor, oxalate of cerium, antipyrine, calomel, and ether, of the same proportion, left less than half of this amount. Oils of cinnamon and cloves markedly retard in the same proportion, but orange, lemon, fennel, turpentine, peppermint, and cubeb, have but little effect. Among the fixed oils, almond, olive, cod-liver, and cotton-seed, were tried and found to have no influence, when four per cent. None of the ordinary salts of alkaloids were found to influence much up to .2 per cent. Strychnine sulphate was the worst, leaving eight centigrams. Out of ten common fluid extracts, rhubarb was the worst, leaving a residue after washing with alcohol before drying, that represented 1.31 grams of undissolved albumen. As a rule, they had very little influence. The tinctures seem to possess no more retarding power than their contained alcohol would give, Oil of tar and balsam copaiba possessed but little influence over digestion.

A STUDY OF PEPSIN.*

BY R. G. ECCLES, M. D., BROOKLYN, N. Y.

When the ancients by rubbing pieces of amber caused them to attract small objects, they little imagined that this phenomenon, so long neglected, contained the promise of the greatest and most startling discoveries of all future ages. Apparently a solitary, trivial and exceptional affair, close investigation proved it continuous with nature's most wonderful manifestations. To this day we cannot tell just what electricity is, but careful experimenting has taught us what it does.

Just as obscure a phenomenon as was the attraction of amber has been known to chemists for a long time by the name of catalysis. It bears a relation to chemistry and biology suspiciously like that which electricity did to physics and chemistry in early times. As electric manifestations were traced over from physics to chemistry before their true bearings were so much as suspected, so those of catalysis remained unthought of except as something curious until they began to follow them over into living beings. Mr. Herbert Spencer, writing of changes wrought in organisms by this force, says: "There is reason to think that the redistribution thus caused is important in amount, if not, indeed, the most important." (Biology, vol. I, p. 35.) In the study of pepsin as a ferment we are brought face to face with this chemical sphynx, and at the very portals of the Temple of Life. Bacterial fermentation, that for so long a time was classified as the same in kind as this, is now known to act in a totally different manner. True catalytic fermentation, like that of pepsin upon albumen, remains as much a mystery to-day as it ever was. Solutions from which the products of digestion have been dialyzed will again and again redigest fresh quantities of albumen, keeping up the process indefinitely if kept properly acidified. There is no limit other than that of accidental waste to the amount. The same pepsin can be again and again precipitated from the solutions where its work is done, and used over in fresh supplies. If an apparent excess of albumen is added to a solution containing pepsin, as soon as digestion ceases a fresh supply of properly proportioned hydrochloric acid and water will cause peptonization to recommence. This can be repeated a number of times. It is theoretically possible for 1 grain of any make of pepsin having power as a ferment in the slightest degree to digest millions of grains of albumen, just as it is theoretically possible for a single gold dollar to redeem millions of dollars of debt. It is accomplished by repeated returnings to the same work.

It is practically possible to make it run far up into the thousands.

* Read at the Third Session.

Your essayist wearied of the task after making 1 grain of an inferior brand digest nearly 4000 grains. Of course dialysis had to be resorted to. After learning such facts, how much intelligent information can an advertiser impart to you when he says that his brand will digest 1150 grains of albumen to the grain? Of course it will, and much more, if it is of any value. And so it would if only one one-hundredth of its present strength. The poorest in the market that can truthfully claim the name can do so. Absolutely pure pepsin has never been isolated. Brücke probably came nearer succeeding than any one before or since his time. He secured an article entirely free from all proteid reactions, possessing the fermenting quality in an eminent degree. (Moleschott's "Untersuchungen," vi., 1859, p. 479.) Every pepsin now upon the market is a mixture of many things, and, while no two precisely agree in contents, they all carry more or less proteid material. This applies to the so-called pure pepsins.

We have no chemical reaction by which to tell pepsin. Its digestive power is our sole means of detecting it. We neither know its color, consistence, nor general appearance. We can neither measure nor weigh it in a manner to gauge its value. That can only be determined by its power as a ferment. Of all articles recognized by the Pharmacopœia it should have the most careful, lucid and complete test of any. Iodine, sugar or quinine, as a rule, are so nearly what their names indicate that our eyes, tongues, and a pair of scales, will save us from serious error in a majority of cases. Not so with pepsin. Here we have no reliance but an authoritative test. Such a test should be, in the highest degree possible for the thing, reliable. Variations in the strength of any drug tend to throw it out of general use if persistent. Serious and persistent variations in pepsin would do the same for it. For medicine to lose the use of pepsin would be a very serious calamity, but one which, as will appear later, is not likely to occur. That the commercial article should average as well as it does is really remarkable, considering the fact that our official test is so bad. The test reads: "One part of saccharated pepsin dissolved in 500 parts of water acidulated with 7.5 parts of hydrochloric acid should digest at least 50 parts of hard-boiled egg albumen in five or six hours at a temperature of 38° to 40° C." Let 100 pharmacists undertake to discover by this test alone the quality of various samples of the same lot of pepsin, and if any two of them agree in their decision it will be because they accidentally supplemented the information here given in the same particulars. The fact is that this test is so imperfect that it is worse than useless, because of its misleading those who would be guided by it. Very few pharmacists will ever think of testing their supplies of pepsin as long as they must burn gas or keep a fire occupied for six hours to do it. The time is far too long. Half an hour or an hour should be the limit. As pointed out by Mr. Coombs in his report to this association last year, no directions have been given for the division of the egg albumen.

It can be introduced in one solid piece, cut into large pieces, small pieces, or middle-sized pieces, to suit the experimenter's fancy. For the sake of still greater variety it can be ground in a mortar into a paste or pressed through sieves of many degrees of fineness, and in every instance there will be no deviation from pharmacopeial directions. When we discover that the rapidity of digestion is directly as the degree of comminution, we see at a glance that the whole thing is reduced to an absurdity, and our test is no test at all. Nor do its sins of omission end here. Important as the diffusion of the produced peptones through the mass is, we are told nothing about shaking. The products of digestion, unless removed quickly or sufficiently diffused, check all digestion. All other things being equal, that one which is shaken most will digest most albumen in any given time. What a chance for variation of results we have here! He who shakes every half-hour will show better results than the experimenter who fails to shake at all, and the outcome will be better and better as the number of shakings in the given time are increased and regular.

It does not tell us whether the pepsin should be dissolved in part of the dilute acid before adding to the albumen, or put in at once as powder, yet the knowledge of how to proceed at this point is quite as important as the last. Other things equal, the predissolved specimen will come out first. Mr. Coombs ("Proceedings" American Pharmaceutical Association, vol. 33, p. 354,) tells us that some of his samples began work in a few minutes, while others did not act for hours, but did good work when they had once begun. This was all no doubt due to his having added them as powders. Some were two or more hours in dissolving. He also claimed that the finer the powder the quicker and better were his results. This tells the same story of slow solution of the coarser and more rapid solution of the finer samples. The facts about powdered and unpowdered pepsins are the reverse of this inference. The same brand of powdered pepsin gives a lower result every time than does the unpowdered. This is probably due to heating of the article during the powdering process. Heat damages pepsin.

Nothing is said in the test about the length of time the eggs should be boiled, whether the albumen should be weighed and used at once, left to cool, left one hour, ten hours, or any other period of time before weighing. Both these considerations have their influence on the amount digested and also on the quality of the product. People's ideas vary as to what constitutes a hard-boiled egg. Before the albumen has thoroughly set the digestion will be more rapid than after, but the product will contain syntonin as well as peptone. If the eggs are boiled too long, the albumen is already slightly digested, and the pepsin and acid have less to do, so can complete their work earlier. Egg albumen can be converted into peptone by continuous boiling without pepsin. Unless the weighing of the albumen occurs immediately upon taking from the

shell, and before cooling, a large per cent. of water will have evaporated, and your quantity of albumen submitted to the digestive test will never be twice the same. No hint is given in the test concerning the temperature at which the pepsin should be added. Unless it and the albumen mixture are of the temperature of the test itself before adding, much time may be lost in reaching it. Especially will this be so in cold weather. The commencement of digestion when all things are favorable, is much the most vigorous period. Five minutes then can do more work than half an hour or perhaps an hour at the close, when the time is extended to five or six hours. Under proper conditions the production of peptones can be graphically represented by a cone whose base is at the commencement and apex at the end. Usually, owing to the time consumed in dissolving the pepsin and raising the temperature to the required height we have a reversed state of the matter up to or beyond the middle of the operation.

We now come to its sins of commission. On fixing the acid strength it is evident that they aimed at having it 0.5 per cent. Instead of ordering water up to $\frac{1}{2}$ liter, a full $\frac{1}{2}$ liter has 7.5 grams of acid added to it. In this way they have given a proportion that it would take a skillful mathematician to calculate the per cent. of. When 7.8334 grams of officinal hydrochloric acid are made up to $\frac{1}{2}$ liter with distilled water, we have a 0.5 per cent. dilute acid. But is 0.5 per cent. the most favorable proportion for digestion? Certainly not. When 0.2 per cent. ends with only 20 cg. of undissolved albumen, 0.5 per cent. swings slowly along with 75 cg. after it; and when both 0.2 per cent. and 0.3 per cent. come out without a remaining shred, 0.5 per cent. was still dragging 10 cg. In temperature they undertook to mimic biological nature, and blundered by doing so. In strength of acid they refused to follow the same guide, where they would have been exactly right. The normal acidity of the stomach during muriatic digestion is 0.2 per cent. What induced them to adopt 0.5 per cent. of acid is a mystery. The most efficient temperature for artificial digestion, as elsewhere shown, is about 55° C. (130° F.) (*Vide* paper on "A Study of Peptonization.") They chose 40° C. (100° F.) as the best.

It must not be understood that these criticisms reflect in the least upon the ability of the gentleman or gentlemen of the Committee of Revision of the Pharmacopœia who had this part of the work in charge. No one could have done better work than they did at that time, and very few could have done as well. It merely goes to show that however erudite a man may be, he cannot be omniscient, and that mortal man cannot produce work that is criticism-proof or that the march of knowledge will not in time discredit in part or entire. The aim of this paper will be reached if it impresses with sufficient force upon the coming revisers of the work the great necessity of attention to details in this matter that are likely to be forgotten or overlooked in their hurry.

With our standard as it is, one might expect to find the pepsins of commerce varying to a very grave extent. Happily this does not appear to be the case, if we consider power to digest alone. In product, however, a serious divergence occurs, of which more anon. Without a standard of any kind to work with, all that the pharmacist can do is to compare the various brands with each other under conditions of approximate identity, and choose that one which for equivalent digestive power costs least. To secure conditions of exact identity is out of the question. There are many brands upon the market, and new ones coming. The saccharated form seems to be less favorably received in some quarters than the so-called scale or pure pepsins. This is probably the result of a difference in the advertising tendencies of the manufacturers. Being anxious to discover the relative values of the brands procurable near me, a number of experiments were made with them. The results are much more favorable than those we have been accustomed to seeing of late, and better than those given us last year by Mr. Coombs in the report of the progress of pharmacy. ("Proceedings" Am. Pharm. Assoc., vol. 33, p. 354). In 15 samples of saccharated pepsin he found but one that could digest 75 times its own weight in six hours. In 12 of the stronger pepsins not one could dissolve 150 times its own weight in the same time. Our methods of procedure may account for our difference in results. If they do not, then he has worse pepsin in his section of the country than can be found in Brooklyn. Saccharated and aromatic pepsins were found almost and quite able to digest 200 times their own weight of albumen in one hour instead of six. With the stronger pepsins 500 times their own weight was reached in the same short time. No doubt by an extension of time and an increase in the quantity of dilute acid (only 50 ccm. was used), with more frequent shaking, they would have dissolved much more. Without doubt several of them could have been carried up to or beyond 1000, the total amount claimed by some of the bolder manufacturers. In securing these results, fresh, clean albumen from eggs that had been boiled 10 minutes was used. Five grams of it was ground in a mortar with 10 ccm. of 0.2 per cent. HCl in water, until no particles were visible, but would readily have passed through a No. 40 sieve. This was poured into a two ounce bottle, the mortar carefully washed three successive times with 10 ccm. each time of the same kind of dilute acid, the washings being added to the first amount. The carefully-weighed pepsin was allowed to dissolve in another 10 ccm. of the acid in a small vial. Bottle and vial being raised to 49° C. (120° F.), the solution of pepsin was poured into the albumen mixture, allowed to remain at or within 2° above or below this temperature one hour in a water oven. A thermo-regulator attached to the gas made it self regulating. Upon removal from the oven they were rapidly cooled and poured into separate balanced pairs of filters, covered to protect from dust, and left over night.

Next day such as were blocked had their excess of moisture drawn up by bibulous blotting-paper, the corner of which alone entered, so as to avoid carrying off undissolved albumen. They were now dried to constant weight, the pair of filters separated, counterpoised, and the result recorded. During the drying process it was found necessary to separate the doubled filters once or twice, especially at their edges, so as to avoid permanent adhesion. Five grams of albumen dried to constant weight were found upon six successive trials to give a mean of 738 mg. Every milligram therefore represents $6\frac{3}{4}$. Precision of course is out of the question in this, as in all other methods. The relative positions are expected to be right, blunders aside, but the exact amounts will necessarily vary in various trials; $2\frac{1}{2}$ cg., or 1 part to 200 of albumen of the following brands of pepsin, were first tried with the results as tabulated. Former reports giving low results led to this meager test. It would be well to add here that they were shaken every 10 minutes. The first column gives the amount of undissolved albumen as calculated from the dried product; the second the number of parts dissolved, the weights of pepsin being 1:

No.	Albumen left.	Parts.
1	None.	200
2	None.	200
3	None.	200
4	None.	200
5	None.	200
6	None.	200
7	None.	200
8	0.06 gram.	198
9	0.13 gram.	196
10	0.25 gram.	190
11	0.34 gram.	187
12	1.13 grams.	155

In order to gain a clearer insight into the respective merits of these goods it was necessary to submit them to a more severe test. The quantity of pepsin was therefore reduced from $2\frac{1}{2}$ to 1 cg. This made the proportions 1 to 500 instead of 1 to 200. The last four having been distanced in the race were dropped, and had to give way to Darwin's law of natural selection. Their full capacity under the given conditions seems to have been reached. The table of pepsin mixtures will show better results than they did. One aromatic pepsin really outstripped these five pure pepsins. The new results under the heavier strain were as follows:

No.	Albumen left.	Parts.
1	None.	500
2	0.06	494
3	0.09	491
4	0.10	490
5	0.11	489
6	0.14	486
7	0.15	485

How much more the London specimen leading this list would have dissolved cannot be said. The rest all come out pretty close upon each other. That labeled Fairchild's seemed to be the best American pepsin, and was, until the one bearing Dr. Beal's name reached me, thought the best in the market. They are all good, however—much better than they generally get credit for—and probably in absolute digestive power capable of doing all their makers claim for them. They occupy relatively to each other, however, a very different position to that the advertisements would make us believe. In order to regulate the quantities of saccharated, aromatic and otherwise mixed pepsins, due regard was paid to the claims of the manufacturers as to the amount of pure pepsin present. The next table therefore gives for each sample the amount used. The time was again 1 hour, the amount of albumen 5 grams, and all other conditions the same as those already given. The amount used was supposed to represent $2\frac{1}{2}$ cg. of pure pepsin, judging from the dose upon the label or the actual statement of the maker's printed formula. The first column is the number and weight of the article, the second the name upon the package,* the third the weight of undissolved albumen in grams and fractions thereof, the fourth the number of parts dissolved, assuming them to contain $2\frac{1}{2}$ cg. of pure pepsin, and the fifth the number of parts dissolved gauged by their actual weight. The proportions submitted, of course, varied widely from the last column:

No.	Weight. Gram.	Albumen left.	Parts to 0.025 gram.	Parts to total weight.
1	0.075	None.	200	67
2	0.075	None.	200	67
3	0.075	None.	200	67
4	0.065	None.	200	77
5	0.096	None.	200	52
6	0.027	None.	200	185
7	0.100	None.	200	50
8	0.125	None.	200	40
9	0.125	None.	200	40
10	0.175	None.	200	21
11	0.175	None.	200	21
12	0.103	0.63	175	42
13	0.085	0.72	171	50
14	0.065	2.83	87	33
15	0.075	3.31	68	22

* Omitted; see Minutes of Third Session.

As 11 out of 15 came through with flying colors, it became necessary to put an extra strain upon them for purposes of further elimination. The actual number of parts to their own weight is now given, and the assumed amount of pure pepsin in their composition no further considered. The following are the results:

No.	Weight. Gram.	Albumen left.	Parts to total weight.
1	0.025	None.	200
2	0.025	0.05	198
3	0.025	0.05	198
4	0.025	0.07	198
5	0.025	0.11	196
6	0.025	0.15	194
7	0.025	0.18	193
8	0.025	0.18	193
9	0.011	0.07	448
10	0.039	0.05	147
11	0.040	0.00	124

The Pharmacopœia only requires the digestion of 50 parts in six hours. Here we discover that with but few exceptions they almost reach four times that amount in a single hour when proper conditions are maintained. Two samples of liquid pepsin were tried at this time. Three ccm. of No. 1 dissolved in a single hour all of the 5 grams of albumen but 1 cg. Sixteen ccm. of No. 2, procured at a Brooklyn pharmacy, only dissolved a little over 1½ grams in the same time. A wide difference, truly! With the pills the figures given are likely to mislead unless explained. No. 10 of the last list is a fraction of a 1 grain pure pepsin pill made heavy by excipient. Enough was taken to represent 1 cg. of pure pepsin. The whole pill containing 1 grain at the same rate as here given would have dissolved in an hour about 490 grains of albumen, which certainly speaks well for it. Nos. 9 and 11 of the same list are quite as good.

The most interesting and profitable part of this work is in discovering the relative cash values of these goods gauged by their peptic power. Most of them are good enough to use with a clear conscience, feeling that your duty is not neglected toward doctor and patient if pharmacopœial requirements are our guide. But some of them may unnecessarily make our pockets ache in their price as compared with the work they do. Let us consider this question.

	Power.	Cost per ounce.*	Value per stand: r l.
1	500 or more.	\$4.00	Unknown.
2	494	1.25	\$1.25
3	491	1.25	1.24¼

* The names are omitted by advice of the Committee on Papers of the American Pharmaceutical Association. No. 1 is a London brand, 2 is American, 3 is the same make but powdered, 8 is aromatized, 9 saccharated and of the same make as 8.

No.	Power.	Cost per ounce.	Value per standard.
4	490	1.80	1.24
5	489	1.25	1.23 ³ / ₄
6	486	0.75	1.22 *
7	485	1.35	1.21 ³ / ₄
8	200	0.35	0.51
9	198	0.35	0.50 ¹ / ₂
10	198	1.67	0.50 ¹ / ₂
11	198	0.80	0.50 ¹ / ₂
12	198	0.67	0.50 ¹ / ₂
13	196	0.50	0.50
14	196	0.35	0.50
15	194	0.71	0.49 ¹ / ₂
16	193	0.59	0.49 ¹ / ₄
17	193	0.34	0.49 ¹ / ₄
18	190	Unknown.	0.48 ¹ / ₂
19	187	0.75	0.47 ³ / ₄
20	155	0.70	0.39 ³ / ₄
21	50	0.34	0.12 ³ / ₄
22	33	0.45	0.08 ¹ / ₂

It is advisable to add in connection with this table that the values here given, as compared with the prices, *only refer to the peptic power* of the articles. With some of the goods other considerations, such as that of the presence of other ferments, may materially raise their value very much, and, indeed, may double or treble the figures given. This is a matter each purchaser must judge for himself. Nos. 12, 16, 17, 21 and 22 come under this head. It is quite fair to compare them with each other, however. In justice to manufacturers themselves, this correction is made. Still another matter should be considered in this connection. Samples with the same name upon the label may not agree always. This can only be discovered by many trials upon a single brand from various batches. Private experimenters cannot afford to purchase so many, nor could they indeed know if they did that all they secured was not from a single batch. Any manufacturer who thinks the goods bearing a label name he claims occupy a relatively wrong position in the list can have my services free of charge in re-testing samples of his make which he is willing to provide. It will give me great pleasure to restate publicly, fully and fairly, the new results. What is here given is simply a matter of fact in my experience, and the values are deduced therefrom. The entire data are therefore of particular and not general application. These results actually did appear during this investigation, and the pepsins did come from packages containing those brands.

* The price of the sample when bought was, we believe, \$1.25. It is now 75 cents. Not being themselves manufacturers, purchasers should inquire about the make and ascertain whether the same brand is always supplied by this name. That used was purchased three years ago.

The standard of value chosen is the market price of Fairchild's scale pepsin. Some of them are worth more than they cost, judging from this standard, and others are of much less value than the price paid for them. It has been observed during these investigations that deliquescent pure pepsins were no better than saccharated in their average strength. A pepsin that gets wet and sticky seems never to be worth much above 50 cents per ounce, when Fairchild's is \$1.25. Five brands here given are considerably cheaper than this standard would make them. Their makers evidently believed in giving good value for the money. The claim has been made that pepsin deteriorates with age. This matter would have been looked into if samples of many years' standing could have been procured. Certainly five years have made but little headway toward reducing the value of the specimen labeled No. 15 of the last table, nor of that labeled No. 6, of three years' standing. They are both good samples of their kind, in spite of age.

We now come to a matter of very great importance which up to the present time has received absolutely no attention from pharmacists, and which certainly should receive due consideration and thorough examination before the advent of the new Pharmacopœia. All that has been deemed necessary for us to consider in buying a pepsin was the amount of albumen it could dissolve in a given time. It now appears that the products of artificial digestion are not always the same. There are peptones and peptones. Among these is one which once formed cannot be digested completely by any amount of pepsin. This is the antialbumate of Kühne, the parapeptone of Meissner. (Reichert's "Foster's Physiology," page 965.) It has the unfortunate habit of becoming precipitated on neutralization. A patient swallowing artificially-digested food containing an abundance of this product is worse off than if he had taken none. Between the acid contents of the stomach and the alkaline circulation lies a line of neutrality right in the wall tissues where this parapeptone is likely to be precipitated and check osmosis. An apparently good pepsin may not be pepsin at all, but what Finkler calls "isopepsin." (Pflüger's "Archiv," xiv, 1877, S. 128). It has suffered modification by its process of manufacture. Instead of producing true peptone, it gives us scarcely anything but parapeptone. Yet an article of this kind would pass muster as a first-quality standard pepsin. As well might you call turpentine by the name of oil of lemon. The Pharmacopœia should give us a means of distinguishing between these and their mixtures, or a device for overcoming their ill effects. During this investigation and that upon peptonization, the discovery was made that the presence of a small proportion of table salt in the digesting mass, checked the production of parapeptone quite effectually. It likewise interferes to some extent in the production of true peptone. Where parapeptones are already formed it precipitates them even in acid solutions. Any formed in the stomach can be precipi-

tated by it before entering the walls and carried through the pyloric orifice into the duodenum with other food that pepsin cannot digest. Trypsin can then change it into an assimilable form. We have hitherto supposed that the sole use of salt as food was in supplying acid and alkali for the system. This never accounted for our taking it with our meals instead of in our drink. Those articles of food most likely to produce some parapeptone even in normal digestion are the very ones that we delight in using plenty of salt with. In the clinical experience of every physician it has been observed frequently that the taking of pepsin has induced on many occasions dyspepsia where it did not before exist, and instead of relieving cases where gastric trouble really existed, it has made them worse. If this had proven a constant occurrence, the pepsin would have been blamed long ago. Only some brands act in this manner. Do such symptoms result from parapeptone, and are such pepsins really isopepsins in part or whole? The future must tell.

BUTTER AND ITS SUBSTITUTES.*

BY E. SCHEFFER, LOUISVILLE.

For the last six months the attention of the public in general has been directed to butter and its substitutes, particularly by the agitation and acts of our last Congress. Every newspaper was full of oleomargarin, and therefore I hope you will not think hard of me when I bring oleomargarin into your meeting.

The writer of this essay does not intend to speak of the merits or demerits of artificial butter, but wishes to lay before you a method by which genuine butter can be easily distinguished and quickly examined.

The ingredients used in the manufacture of artificial butter are chiefly beef suet, lard, and inodorous fatty oils. They are mixed in suitable proportions to obtain the consistence and melting point of genuine butter, and are churned together with fresh milk.

Butter contains only a very small quantity of stearin, while the other half-solid and solid animal fats contain a larger amount, so that a greater abundance of stearin in butter is an indication that tallow or lard have been mixed with the butter, either as such or in the form of oleomargarin or butterine.

My object was to find a suitable solvent by which not only the artificial butters can be easily distinguished, but which would serve also to ascertain if genuine butter was mixed with one or the other of these substitutes.

A liquid which shows a great difference in its solvent action on stearin

* Read at the Fifth Session.

on one side, and palmitin and olein on the other, might therefore answer the purpose.

After having tried different mixtures, and experimented at last with mixtures of rectified fusel oil and stronger ether in different proportions, we at last accepted a liquid consisting of 40 volumes of rectified fusel oil and 60 volumes of Squibb's stronger ether.

Having procured genuine butter from different parties in the country, it was first ascertained how much of this solvent was needed, and at what temperature a certain quantity of pure butter fat would be dissolved to a clear liquid. Butter fat was obtained by melting butter on the water-bath, and decanting and filtering the liquid fat through dry filter paper in a glass funnel, surrounded with hot water. The beaker with the filtered fat was placed in cold water and the fat stirred constantly until perfectly congealed to a homogeneous mass. All the other fats experimented with were prepared in the same way.

Of the above solvent 1 gm. pure butter fat required 3 cc. at 79° to 82° F., to be fully dissolved to a clear liquid; that is, of 5 samples of butter fat 1 dissolved in 3 cc. at 79° F., 2 dissolved in 3 cc. at 80° F., and 2 dissolved in 3 cc. at 82° F.

By its taste and general appearance the butter whose fat required the temperature of 82° F. to be fully dissolved was considered the best, and therefore 82° F. were taken as standard for all the following experiments.

Before going further, the solubility of beef suet, leaf lard and cotton seed oil was tested, and also of pure stearin, which I had prepared from tallow—melting point, 144° F. The experiments were executed in the way described further on; the temperature after having reached 82° F. was kept constantly at this point.

0.2 beef suet	required 10 cc. or 1 gm.	50 cc.
0.5 leaf lard	"	8.2 cc. or 1 gm. 16.4
2 cc. cotton-seed oil	"	3.5 cc.
0.02 stearin	"	11 cc. or 1 gm., 550 cc.

To find out if the presence of a more soluble fat would increase the solubility of stearin, 0.02 stearin, and 1 cc. of cotton-seed oil were melted together. After cooling, 3 cc. of solvent were added, and the test tube with contents immersed in water of 82° F.; after a short time it was shaken and a clear liquid was obtained. Another 0.02 stearin dissolved in 1 cc. of cotton-seed oil was, after addition of 3 cc. of solvent, immersed in water of 65° F. and then set in a water bath, in which the temperature was gradually brought to 82° F.—for this instance the stearin was not dissolved and more solvents had to be added. It required pretty near the same amount as when stearin was tested by itself. It seems therefore that at a higher temperature (at 82° F.) the mixture of stearin and oil dissolves as a whole, while at a lower temperature the solvent acts separately, first on the oil and then on the stearin.

0.02 stearin melted together with 0.98 butter dissolved in 3 cc. of solvent when immersed in water of 82° F.; while when first exposed to a lower temperature and then gradually heated to 82° F. it required 7 cc. In this instance the stearin did not require as much solvent as in the experiment with cotton-seed oil; the margarin in the butter, no doubt, increased the solubility of stearin.

On this department of stearin, that, when mixed with other neutral fats, it requires more solvent when gradually heated from a lower temperature up to 82° F. than when exposed to this temperature at once, my method of examination is based.

The experiments were made in well corked small test tubes containing 1 gm. of the fat, or 0.5 gm. according to quality of fat, and 3 cc. of solvent. They are immersed in a tumbler of water of about 65° F. and the tumbler is placed in a double water-bath, heated with a very small flame, so that the temperature rises but very slowly. A thermometer is also placed in the tumbler. While the temperature increases the test tubes are shaken frequently and when 82° F. is reached, care is taken that this temperature is kept constant. If not clear at this temperature, more of the solvent is added from a burette to the contents in test tube, according to the turbidity of the mixture 2 cc. or 1 or 0.5 or even less at a time, until ultimately all is dissolved. The test is finished when the liquid has become quite clear and by gentle shaking of the test tubes no silky clouds of fine stearin crystals are seen floating in it.

The following tests were made. The samples were obtained from regular dealers in our city, except the three last ones, which were kindly sent to me by a manufacturing firm of Chicago:

1. gm. Country butter dissolved		at 82° F., in	3 cc.
1. gm. Creamery butter required		"	3 cc.
0.5 gm. Oleomargarin	" 5.6 cc.	" or 1. gm.	11.2 cc.
0.5 gm. Butterine No. I.	" 5.5 cc.	" "	11 cc.
0.5 gm. Butterine No. II.	" 4 cc.	" "	8 cc.
1. gm. Oleomargarin	"	"	8.6 cc.
0.5 gm. Neutral Lard	" 6.75 cc.	" "	13.5 cc.
1. gm. Oleo-oil dissolved in	3 cc. at 75° F.		
2. gm. Oleo-oil required at 82° F.	4.6 cc.	or 1. gm.	2.3 cc.

These numbers speak for themselves. From the difference in solubility between oleo-oil and oleomargarin we may infer that the oleomargarin consists for the greater part of lard.

We may assume when 1 gm. butter fat is dissolved at 82° F. in 3 cc. of the solvent, the liquid is at this temperature saturated, if not with margarin at least with stearin. The requirement of more solvent indicates a larger amount of stearin, or of stearin and margarin, and this the presence of tallow or lard. The more solvent is needed to accomplish perfect solution, the more of these admixtures are present.

It was now expedient to ascertain if this method might and could be used for quantitative examination of spurious butter. For this purpose butter and leaf lard in different proportions were melted together, and after cooling tested.

1.	gm. butter required at 82° F.	3. cc.
0.05	leaf lard } “ “	3.5 cc.
0.95	butter }	
0.1	lard } “ “	3.9 cc.
0.9	butter }	
0.2	lard } “ “	4.8 cc.
0.8	butter }	
0.3	lard } “ “	5.7 cc.
0.7	butter }	
0.4	lard } “ “	6.5 cc.
0.6	butter }	
0.5	lard } “ “	7.8 cc.
0.5	butter }	
0.3	lard } required at 82° F. 4.8 cc. or 1 gm. 9.6 cc.	
0.2	butter }	
0.35	lard } “ “ 5.7 cc. “ 11.4 cc.	
0.15	butter }	
0.4	lard } “ “ 6.5 cc. “ 13 cc.	
0.1	butter }	
0.45	lard } “ “ 7.2 cc. “ 14.4 cc.	
0.05	butter }	

The quantity of solvent needed in these experiments is not proportionate to the respective quantity of lard and butter, but nevertheless there is a certain regularity in it. So from 5 to 40 per cent. of lard in the butter, the quantity of solvent needed above 3 cc. goes in almost a regular progression, and is such that for each 10 per cent. of lard, 0.9 cc. more of solvent is needed above 3 cc.; and from 40 per cent. of lard up to 90 per cent., the total quantity of solvent is about the same as when no butter had been present—counting for each 0.1 gm. of lard 1.6 cc. of solvent. See the solubility of leaf lard.

According to this table, butterine No. 1 would contain about 70 per cent. and butterine No. 2 about 50 per cent. of lard, which might not be far from being correct.

If a more soluble lard than leaf-lard was used for mixing with the butter, the quantity of solvent used would indicate a larger percentage of lard.

By the butyric ether test, butterine can be easily distinguished from oleomargarin. For qualitative examination of butter this method recommends itself by its simplicity, by its easy execution, and by the quickness with which many tests can be made at one time; and for quantitative examination it is for all purposes exact enough. When once an adulteration of butter is proven, it does not matter much whether 5 per cent. of admixture more or less is present.

III. MATERIA MEDICA.

GUARANA : METHODS FOR ITS ASSAY AND THE ASSAY OF ITS FLUID EXTRACT.*

BY H. W. SNOW, PH. C., DETROIT.

In the *American Journal of Pharmacy*, 1875, 135, is a method proposed by E. S. Wayne for the extraction of caffeine from tea and coffee, with the remark that it yields very high results of a pure white alkaloid. Later on F. V. Greene (*Amer. Jour. Phar.*, 1877, 337) applied the process to guarana as a method of assay. J. H. Feemster (*Proc. A. P. A.*, xxx, 569) more recently, has also recommended this method as a practicable assay process and suited for pharmaceutical purposes. The criticism, which the writer would offer upon it, is chiefly the length of time required to complete the operation, but also, as compared with the process to follow, gives lower results, indicating a less perfect exhaustion of the drug.

In the boiling with litharge, several hours are consumed, which followed by filtration, washing, removing the lead, etc., extend the operation over the greater part of two days, and occasionally longer, and requiring considerable attention during the whole of that time. Any process then, which can be begun late in the afternoon of one day, and finished easily in four or five hours the next day, all other things being equal, will recommend itself to all who are engaged in making a number of pharmaceutical assays each day. But particularly would it be desirable when along with rapidity we get a more perfect exhaustion of the drug. The process which the writer has to suggest is not new, except in its application to this drug, being the same as that proposed by A. B. Lyons for the assay of *nux vomica* (*Drug. Circ.*, 1886, 137) and which is briefly described as follows :

Place 5 grams of the powdered drug in a small flask holding about 100 cc. or 120 cc., introduce 44 cc. of chloroform, cork and shake, and then add 6 cc. of a mixture of alcohol 6 volumes and stronger water of ammonia 1 volume, again shake vigorously and set aside for several hours with frequent agitation, or allow to stand over night. Then filter rapidly through a small dry filter paper, four to four and one-half inches in diameter, receiving the filtrate in a vessel graduated to 40 cc. (corresponding to 4 grams of drug). Evaporate the chloroform and treat the residue with a little water, warm, and filter through cotton, afterwards passing the liquid through an ordinary filter and using the wash water from the cotton filter as wash water for the second filter. The washing should be continued until a few drops cease to precipitate with phospho-

*Presented at the Fifth Session.

molybdic acid. The operation of filtering and washing does not take much time, and if the cotton filter clogs it is easy to stir up the insoluble fatty or waxy matter so as to permit the liquid to pass through. The aqueous liquid which will usually measure 40 cc. or 50 cc. is next placed in a separator and washed with successive portions of chloroform until the aqueous liquid ceases to precipitate with phospho-molybdic acid. Two washings are generally sufficient, though the writer always applies the test before discontinuing the washing, and in fact, it is always better for the operator whenever possible to assure himself by some such test that the alkaloid is all contained in the liquid supposed to contain it. The chloroform solution is now evaporated in a weighed beaker and the residue dried one-half hour at 100°C ., cooled and weighed—the weight in grams multiplied by 25 gives the percentage of alkaloid. This process gives somewhat higher results than that of Greene, which in a sample of guarana showed 4.14%, duplicate 4.28% of alkaloid. The same drug assayed by the above process showed by four different assays 4.64%, 4.84%, 4.66%, 4.89% of caffeine. The writer also tried Prollius' fluid for the assay of cinchona barks, but without success, the same drug as above showing only 3.97% of alkaloid. In general, ether is not so well suited for the extraction of caffeine as either benzol or chloroform, owing to the comparative insolubility of the alkaloid in that menstruum. Ammoniated ether and ammoniated chloroform were both tried for the extraction of caffeine from kola nuts, yielding in the one case 1.34% and in the other 1.45% of alkaloid, which did not however seem in such a pure condition as in the case of guarana. In the "New Idea" (1886, p. 495), the writer gave the results of a number of assays of fluid extract of guarana, which will probably be of interest here. The process employed was practically as follows: Evaporate 5cc. of the fluid extract to dryness with about one ounce of litharge, powder, introduce into a flask of about 120 cc. or 150 cc. capacity, pour in 100 cc. of chloroform and shake repeatedly during three or four hours, and finally filter through a dry filter containing some magnesia, which removes suspended particles of insoluble matter which would be difficult to remove without some such device as the magnesia; 80 cc. of the filtrate corresponding to 4 cc. of fluid extract are then evaporated, dried $\frac{1}{2}$ hour at 100°C ., cooled and weighed. The weight in grams multiplied by 25 gives the percentage of alkaloid extracted from the drug; and this percentage divided by the spec. grav. of the fluid extract gives the percentage in the latter. The above gives results agreeing with those obtained in the same fluid extract by using Greene's method slightly modified. Applying the above process to a number of commercial fluid extracts, results were obtained as shown in the following table.

No. of Sample.	Sp. Gravity.*	Per cent. of alkaloid ex-tracted from the drug.	Per cent. of alkaloid in the fluid ex-tract.	Grains of caffeine in each fluidounce.
1	1.0227	2.70	2.69	12.35
2	1.0182	2.75	2.70	12.55
3	0.9587	2.72	2.84	12.44
4	0.9947	2.93	2.94	13.36
5	0.9536	2.99	3.13	13.67
6	1.0409	3.57	3.42	15.29
7	0.9848	3.40	3.45	15.51
8	0.9797	3.52	3.60	16.08
9	0.9508	3.70	3.89	16.88
10†	1.0515	4.85	4.61	22.13
Average	0.9856	3.31	3.33	15.03

The National Dispensatory (3d Ed., p. 369) credits E. Hosack (1883, the writer has not been able to consult the original paper) with the statement that commercial fluid extracts of guarana yielded only 1.10% to 1.68% of caffeine, while it will be seen that the *average* of the above fluid extracts is 3.33% or practically double the highest estimate given by Mr. Hosack. The experiments of J. H. Feemster already referred to, show that guarana assays on an average 4.32%, so that the above fluid extracts fall considerably short of perfect exhaustion of the drug. Later, the writer has sought a process which should be more economical as regards time and chloroform, which latter in the process as originally applied required considerable amount. It suggested itself that the well-known power of slaked lime in removing organic matter from solution might be applied with good effect, and as a result the following process was found most satisfactory. 15 cc. of fluid extract are placed in a small flask, 30 cc. of water are added, and the mixture shaken up with 2 grams of slaked lime. Filter through a small dry filter paper four to four and one-half inches in diameter and taking 15 cc. of the filtrate (corresponding to 5 cc. of fluid extract), neutralize with a few drops of dilute sulphuric acid, avoiding an excess, and evaporate to dryness, digest with a little water, filter, wash until washings cease to precipitate with phospho-molybdic acid, make alkaline with ammonia, wash with chloroform three times, etc., etc. This last method gives higher results than the first method given, and corresponds more nearly with the ammoniated chloroform process for the drug. The above processes all yield the alkaloid in a pure white mass, and though as yet no definite experiments have been performed to show that it is wholly alkaloidal, there seems little or no doubt that the mass is so. Experiments to prove absolutely that this is the case must be reserved for a future paper.

* Specific gravity was taken at the temperature of the work-room (26° C.), compared with water at the same temperature.

† This was a fluid extract which had evidently been standing for a considerable length of time in a nearly empty Lottle, which probably accounts for its unusual strength.

THE QUALITY OF BELLADONNA LEAVES.*

BY A. B. LYONS, M. D., DETROIT.

QUERY NO. 103.—*What is the quality of the belladonna leaves of our market?*

A report was made on the subject of this query to the Ohio State Pharmaceutical Association, which I had not met with at the time I accepted the query. I gladly avail myself of the material supplied by this paper, which is by Prof. Coblentz, a member of our Association, in addition to that which I have myself gathered.

Several processes for the assay of belladonna leaves have been published within a few years. The methods formerly adopted were more or less tedious, and required for their satisfactory execution a considerable amount of material.

The plan which I have for several years practiced with satisfaction commends itself by its simplicity and rapidity. The drug is perhaps incompletely exhausted, particularly where it is rich in alkaloid, but comparative experiments have shown that for practical purposes the results are fairly trustworthy.

The belladonna leaves are reduced to a No. 30 powder; I do not think it is worth the while to try to make a finer powder. Ten grams of the powder, accurately weighed, are introduced into a bottle or flask, and 100 cc. of a mixture of ether 65 volumes, alcohol 5 volumes, and stronger ammonia 1 volume, is poured in, and the flask or bottle is at once securely corked. The mixture is shaken at intervals during twenty-four hours. At the end of that time 50 cc. of the clear supernatant fluid is measured out, transferred to a two-ounce prescription vial, and shaken with 5 cc. of water containing about 10 drops of dilute sulphuric acid. Care is taken that the acid is in excess. When the aqueous acid is separated, the ether is transferred to another similar vial containing 5 cc. of acidulated water, with which it is shaken a second time to remove the last traces of alkaloid. When it has separated a second time, the ether is decanted into a receptacle for waste ether. By this mode of manipulation the danger of loss of alkaloid by decanting is avoided, and it is not necessary to wait for the subsidence of the minute particles of aqueous fluid which do not separate at once.

The contents of the first vial are washed with two or three successive portions (10, 10, and 5 cc.) of ether, which is subsequently used to wash also the contents of the second vial, and is then transferred to the waste ether bottle. When the washing is judged to be sufficient, ammonia is added to the contents of both vials, in slight excess, and the alkaloid is taken out by shaking with a mixture of chloroform one volume and ether

* Presented at the Fifth Session.

three volumes, three successive portions of 15 cc. being generally sufficient. The ether chloroform is shaken first with the stronger fluid in vial No. 1, and then with the weaker, after which it is transferred to a tared capsule, and evaporated to dryness at a water bath heat. The aqueous fluid is tested after the third washing, to make sure that it is free from alkaloid. This is done by placing a drop of the fluid upon the surface of a mirror, rendering it acid, and adding a drop of Mayer's reagent. If this produces more than a very faint cloud, the alkaline solution is to be made acid, then again rendered alkaline, and at once shaken with a fresh portion of the chloroform ether.

When completely dry, weigh the alkaloid, and further demonstrate its purity by dissolving it in a little dilute sulphuric acid. If it is not wholly soluble, separate the insoluble portion by taking up with ether, evaporate the ethereal solution, weigh the residue, and deduct from the weight of the crude alkaloid. If the operation has been carefully conducted, however, there will be scarcely a weighable amount of impurity.

A further check upon the weighing may be secured by titrating the acid solution of the alkaloid with Mayer's reagent, or, better, by precipitating with a slight excess of Mayer's reagent, and drying and weighing the precipitate as recommended by Dragendorff.*

The crude alkaloid may be purified by the method described by Dunstan and Ransom, by precipitation from acid solution with iodine, and decomposition of the precipitate with thiosulphate of sodium; but in practice the weight of the crude alkaloid obtained by the process described, may be accepted as a sufficiently accurate measure of the value of the drug.

The alkaloid obtained by this assay process consists of a mixture of atropine and hyoscyamine. That these two alkaloids differ somewhat quantitatively, if not qualitatively, in their physiological and therapeutic action, is probable, and hence we cannot expect that the results of an assay will enable us to fix to a nicety the dosage of the drug. Dr. Squibb has shown that as a matter of fact, the mydriatic activity of different specimens of crude alkaloid obtained from belladonna leaf and belladonna root respectively, do not exactly coincide. The variations in activity of the drug dependent upon such differences, are insignificant in comparison with the differences due to deficiency or excess of alkaloidal constituents.

The proportion of alkaloid present in belladonna leaf and root of good quality, has been variously stated by different authorities. The following are a few of the results that have been reached by different investigators:

* Werthbestimmung einiger starkwirkenden Drogen.

	Root.	Leaves.
Lefort, 1872,	young .6	.44
“	old .25	
Dragendorff, 1874,	.5	.66
Buddel, 1882,	amylaceous .4 to 1.0	
“	non-amylaceous .14 to .63	
Gerrard, 1880-85,	.21 to .45	.22 to .58
Dunstan and Ransom, 1883-85,	.35 to .39	.15 to .22
Dr. Squibb, 1885,	.42 to .50	.26 to .34

A. W. Gerrard, in his reports to the British Conference, has given results of numerous assays, arriving at the conclusion that the proportion of alkaloid in the leaf is greater than that in the root of the plant. The following are some of his figures :

Proportions of alkaloid found in Belladonna leaf and root by A. W. Gerrard.

		Root.	Leaf.
Wild plant,	on chalky soil	.21	.23
“	“ leaf mold	.09	.22
“	2 years old	.26	.43
“	3 “ “	.38	.41
“	4 “ “	.41	.51
Cultivated plant,	2 “ “	.21	.32
“	“ 3 “ “	.37	.46
“	“ 4 “ “	.31	.49
“	“ in May, ...	.21	.25
“	“ in June, ...	.32	.36
“	“ in July, ...	.32	.34

It is commonly believed that belladonna root is more active than the leaf, and while the results above given must be accepted as true for freshly gathered specimens of the drug, it is probable that the popular belief has a good foundation, at least as regards the drug as it is met with in commerce. My own assays, given later, confirm those of Dr. Squibb in giving precedence decidedly to the root.

It has come in my way, during the last few years, to make numerous assays of belladonna leaves and root, such as is offered in the New York market as of the first quality. The results of some of these assays will be given in connection with those that have been undertaken with more especial reference to the purpose of the present query. To ascertain whether the drug ordinarily sold in the drug stores is of fairly good quality, I procured from a wholesale dealer in this city a sample from bulk stock and another of the pressed herb, of which he carried only one brand. From various retail drug stores I procured samples of the drug ordinarily sold, without intimating the use I meant to make of it. The drug was kept by all the retailers but one, only in pressed packages, and all the packages procured bore the name of the firm which sent them out, and no two were from the same firm. I procured also

from New York eight samples from importing houses and large dealers. The results of assays of these various samples I found more favorable than I had been prepared to expect, particularly in the case of some of the pressed packages which were evidently several years old. (Nos. 1 and 2 c. in the tabulated results below).

The market value of belladonna leaves is fixed at present purely by external characters. In the tabulated results I have given the comparative prices in contrast with the figures showing true value. It is evident that large purchasers can afford to buy this drug by assay, unless the quality of the drug they handle is a matter of indifference to them.

The results reached in the assay of these samples were as follows (drug in the air-dried condition):

A. Samples from large dealers in New York.

No.	Per cent. alkaloid.	Comparative price.
1	0.44	100
2	0.37	115
3	0.38	110
4	0.37	110
5	0.61	110
6	0.39	120
7	0.70	115
8	0.59	160

B. Leaves, loose, purchased in Detroit.

No.	Per cent. alkaloid.
1	0.40
2	0.29

C. Leaves in pressed packages.

No.	Per cent. alkaloid.
1	0.62
2	0.59
3	0.41
4	0.29

From notes of assays, that I have had occasion to make within the past twelve months, of belladonna leaves and root, offered in the New York market as of prime quality, I take the following data (drug in air-dried condition):

BELLADONNA LEAF.

No.	Per cent. moisture.	Extract yielded to 60% alcohol.	Per cent. alkaloid.
1	9.55	20.5	0.42
2	8.15	19.0	0.41
3	9.52	30.7	0.42
4	7.93	25.5	0.41

No.	Per cent. moisture.	Extract yielded to 66% alcohol.	Per cent. alkaloid.
5	10.24	23	0.40
6	9.73	21	0.68
7	8.92	23.8	0.51
8	9.31	24.3	0.50
9	9.45	25.3	0.55
10	8.77	21.0	0.49
11	11.42	16.2	0.42
12	9.35	19.5	0.48
Averages	9.36	22.5	0.474

The highest percentage observed by me was 0.87, the lowest 0.23, average about 0.44.

BELLADONNA ROOT.

No.	Per cent. moisture.	Extract yielded to 66% alcohol.	Per cent. alkaloid.
1	9.2 . . .	30.2	0.86
2	8.4 . . .	24.7	0.42
3	6.7 . . .	25.4	0.62
4	8.8 . . .	26.3	0.77
5	5.7 . . .	31.3	0.64
6		26.6	0.72
7		25.2	0.55
8		23.5	0.52
9		31.0	0.60
10		24.8	0.62
11		21.3	0.51
12		24.9	0.59
Averages	7.76	26.27	0.618

The following are the results of the assays made by Prof. Coblenz.* The samples examined were stated to include drug in pressed packages as well as the loose German and Allen's English. Several of the American pressed packages were musty and contained a large proportion of stems. The quantity of alkaloid is stated to be that obtained from 100 grams of dry drug. Either the decimal point has been misplaced, or this is a misprint for 10 grams.

No.	Crude alkaloid.	Purified alkaloid.
1	.0179	.0171
2	.0095	.0090
3	.0205	.0182
4	.0439	.0433
5	.0405	.0398
6	.0050	.0020
7	.0117	.0109
8	.0092	.0090

* American Druggist, July, 1885, p. 127.

GERMAN LEAVES.

No.	Crude alkaloid.	Purified alkaloid.
1	.0221	.0212
2	.0432	.0420
3	.0185	.0180
4	.0127	.0109

ENGLISH LEAVES.

1	.0426	.0422
2	.0417	.0411

SUMMARY OF CONCLUSIONS.

From the data furnished by these various assays we may conclude:

1. That belladonna is a drug, subject to great variations in strength, so that of two samples rated as of equal commercial value one may be of double the strength of the other.
2. That the proportion of alkaloid contained in good belladonna leaves is higher than what has been generally stated.
3. That belladonna leaves that have been kept in pressed packages for several years do not show evidence of loss of alkaloid. It is of interest in this connection to note that the best sample of pressed leaves examined was a very unpromising one put up by the Shakers, and evidently quite old.
4. That while there is no doubt much belladonna of a very inferior quality in the market, that which is offered as prime is generally fairly good.
5. That belladonna root as met with in our market is richer in alkaloid than belladonna leaf, and that the extract prepared from the root should also contain a larger proportion of alkaloid than that made from the leaf with the same menstruum.

Finally, I wish to urge the importance of fixing for such active drugs as belladonna authoritative standards of strength, and of requiring that the official preparations of such drugs be brought by official requirement to such a definite alkaloidal standard.

AN ANALYSIS OF THE UNDERGROUND PORTION OF PHLOX CAROLINA.*

BY HENRY TRIMBLE, PHILADELPHIA.

This investigation was undertaken by Mr. S. M. Harrington, a student in the laboratory of the Philadelphia College of Pharmacy, but after doing some of the preliminary work, he had to relinquish it, and with his permission I began the investigation anew.

* Read at the Fifth Session.

The scheme proposed by Dragendorff was used as the basis of the work. And I wish to state, in connection with this, that considerable objection has been offered to this method of plant analysis as being too mechanical, and only the blind following of another's plan. I reply that, when there is any reasonable ground for such criticism, it is the fault of the chemist doing the work and not of the method. A scheme of some kind is obviously necessary, and immensely better than a fragmentary examination for an alkaloid, glucoside, or some other new compound, without first determining all the important constituents. The method of Dragendorff has been found to be the most satisfactory of a number that have been offered, and the results will always show originality, if that faculty has been exercised. It is as absurd as to question the analysis of a mineral by the use of hydrochloric acid, sulphuretted hydrogen, and the other group reagents.

The following summary of results will afterwards be taken up in detail:

	Per cent.	
Moisture	7.82	
Ash	16.70	
Camphor with red coloring	1.00	Soluble in petroleum spirit.
Resin	.44	“ stronger ether.
Tannin.	1.82	Soluble in absolute alcohol 9.96 %
Glucose	.27	
Saccharose	.78	
Undetermined.	7.09	
Gum	2.34	Soluble in water 8.68 %
Glucose	.33	
Allied sugars	1.49	
Albuminoids	4.52	
Albuminoids soluble in dilute alkali.	.99	Soluble in dilute hydro- chloric acid 10.86 %.
Calcium Oxalate	2.90	
Gum.	.36	
Undetermined	7.60	
Volatile Acid, Butyric	Trace.	
Lignin	5.53	
Cellulose and allied substances	36.65	
Total	98.63	
Less Calcium Oxide in Calcium Oxalate	1.19	
	97.44	
Loss	2.56	
Total	100.00	

Of all these different portions, that soluble in petroleum spirit is the most interesting. The solution was red and fluorescent, and on evapor-

ating the solvent the residue separated in fern-like masses of crystals on the side of the vessel, while that in the bottom formed into star-like circular masses of acicular crystals. These crystalline forms disappeared to a great extent on removing the mother-liquor. The dry residue was treated with 66 % alcohol to remove the red coloring matter, and the residue thus purified was crystallized three times from 95 % alcohol, by using it boiling hot, and then twice from absolute alcohol, which left the compound in white, opaque, warty crystals in the bottom of the beaker, and the fern-like crystals on the side. The finest crystals were gotten by allowing the hot 95 % alcoholic solution to cool slowly.

FIG. 1.



Fig. 1 shows a crystallization in the bottom of the dish, made up of a compact mass of acicular crystals supporting one another, with the radiating growth around the base. Fig. 2 shows the same on the side of the vessel.

FIG. 2.



Physical Properties.—This compound has a slight aromatic odor, but no taste ; it is readily dissolved by chloroform and ether in addition to the above-mentioned solvents. Its melting point was found to be 155.4°C. , although further purification may alter this figure slightly. On heating a little above its melting point it sublimes. A transparent crystal causes a beautiful play of colors with polarized light.

Chemical Properties.—On heating above the melting point it ignites

and burns with a smoky flame. Bromine dissolves it readily, exhibiting considerable chemical activity, but very little heat. Concentrated sulphuric acid dissolves it with a brownish color, strong nitric acid slowly acts on it without decided coloration, and glacial acetic acid dissolves it readily, and from this solution water precipitates it. This may prove to be a valuable method of purification. Concentrated solutions of the alkalis appear to have no effect.

In view of all these properties, this compound is considered to belong to the camphor group, and according to the custom of naming, *phloxol* is suggested to designate it.

Spigelia was also treated with petroleum spirit, but no such compound was obtained; this solvent, therefore, immediately suggests itself as a means of distinguishing *spigelia* from *phlox*. For the two drugs in the normal condition, the physical appearance is sufficient. The fluid extracts or other liquid preparations could not be thus distinguished, because dilute alcohol, which is employed as the solvent, does not dissolve the camphor. It might, however, be used to distinguish the powders or mixtures of them.

I regret that the results of an ultimate analysis could not be included in this description. This, however, is reserved for another paper, because there have been discovered during the past year, in the same laboratory, two other new crystalline compounds which closely resemble this; one in a bark from Honduras, by Mr. F. Holberg, for an account of which see "Am. Jour. of Pharmacy," May, 1886. The other was likewise discovered in a Honduras drug by Miss Helen C. D. Abbott, and an account of it read by her before the American Association for the Advancement of Science at its recent meeting in Buffalo. These three interesting compounds will be made the subject of another paper.

The other soluble portion contained a small quantity of the red coloring matter which was found with the camphor. On evaporating the ethereal solution to dryness and treating with water, a solution was obtained which gave no indication of the presence of alkaloids or glucosides, but on evaporation over sulphuric acid a minute quantity of crystals formed which were not further examined.

That portion of the original drug which dissolved in absolute alcohol was found, after evaporating the solvent, to be completely soluble in water. It amounted to 9.56%, of which 1.82% was tannin, 1.05% sugar and 7.09% undetermined. A separate determination of the tannin in the original drug by the gelatin and alum process confirmed the estimation of that substance. This tannin was found to be of the variety which forms with salts of iron a green color. The remaining solvents did not dissolve anything of especial interest.

Fifty grams of the original drug were distilled with milk of lime, but tests applied to the distillate showed the absence of a volatile alkaloid.

Another quantity distilled with dilute sulphuric acid furnished a distillate acid in reaction and unaffected by barium chloride or neutral lead acetate, but forming a white precipitate with basic lead acetate. The remainder of the distillate was treated with slight excess of pure barium carbonate, evaporated to small bulk and set aside over sulphuric acid to crystallize. The result was a small amount of crystals of the barium salt, which, on treatment with concentrated sulphuric acid, gave an odor strongly resembling butyric acid. This was not further examined, as the amount present could not be considered more than a trace.

THE ASSERTED PRESENCE OF NICOTINE IN CANNABIS.*

BY GEORGE W. KENNEDY, POTTSVILLE, PA.

QUERY No. 97.—*Does Cannabis Indica contain Nicotine?*

In the year 1876, Preobraschensky claims to have obtained nicotine from Bucharian hashish, and also from gunja. After this announcement was made, several chemists experimented with Indian hemp with a view of isolating the nicotine, but were unsuccessful in their efforts, even after repeated examinations were made.

For the extraction of the alkaloid nicotine from the herb *Cannabis indica*, it was submitted to two different treatments. My object for doing so was, in case I should fail in one manipulation, I might be more successful in the other; besides, I would have stronger evidence of the presence or absence of the base I was in search of.

It is well known that the alkaloid is not a permanent base, but quickly assumes a brown color on exposure to the air and light, and is partly converted into a resinous compound. According to good authority it appears even to undergo an alteration by repeated distillation in an atmosphere deprived of oxygen. It is therefore necessary to observe many little points, apparently trifling, but yet of much importance in pursuing an investigation of this character, so as to obtain satisfactory and conclusive results; a failure to observe any one of them in all probability would give quite contrary conclusions.

In order to make myself feel more satisfied with my work, I decided to operate with tobacco for nicotine at the same time, the treatment being precisely the same in every particular and detail, so that if I succeeded in obtaining the alkaloid from tobacco by either or both of the processes, then there would be no reason why I should not be successful in extracting it from *Cannabis indica*, if present.

In the one process I prepared an alcoholic extract of each by moisten-

* Read at the Fifth Session.

ing the powdered drug with alcohol, packing in a conical-shaped glass percolator, and after standing in this condition for 24 hours, pouring alcohol on the packed drug until exhausted, paying strict attention so that percolation would proceed slowly, reserving the first third of the percolate, evaporating the remainder at a temperature not exceeding 50° C. (122° F.) to a proper consistence, adding the reserved portion and evaporating to a pilular mass. In each case 2 pounds of the drug were used, with the following yield: Tobacco $3\frac{1}{8}$ ounces, *Cannabis indica* $3\frac{1}{4}$ ounces; the former $9\frac{8}{10}$ per cent., and the latter 10 per cent.

Dragendorff states that nicotine may be readily obtained by means of ether, chloroform, benzol, or petroleum benzine. The extract of each drug was treated with a small quantity of alcohol acidulated with sulphuric acid, after which water was added and the alcohol evaporated; the resinous matter set free was separated by filtration. The acid filtrate was then agitated with ether, and the watery acid liquid separated, rendered alkaline by KHO, and agitated with ether. The ether would take up the nicotine, if present, and could be obtained by spontaneous evaporation. Since however the alkaloid is easily altered, only a portion of the ethereal solution was evaporated, the object of which was to procure a small quantity of pure nicotine. In evaporating the last traces of ether present from the almost colorless base, I observed that the alkaloid was undergoing a change, as it soon showed signs of decomposition by slowly changing to a dark-brown color. The second portion was converted into a salt by agitating with slightly acidulated water (H_2SO_4), driving the ether off, and afterwards evaporating the watery liquid. In this examination the Indian hemp gave negative results; but when a solution was tested with the general alkaloid reagents, as the potassio-mercuric iodide and phosphomolybdic acid, a very faint precipitate was perceptible.

The second process was conducted by exhausting the bruised drugs with acidulated water, evaporating this acid liquid to a small bulk, and then distilling with a solution of caustic potassa. The distillate was neutralized by dilute sulphuric acid to combine any alkaloid present, and the slightly acid solution was tested with the alkaloid reagents. Like in the preceding experiment a faint indication of the presence of an alkaloid was shown by a very light precipitate. The neutralized solution as obtained above was then evaporated to dryness on a water-bath, and treated with absolute alcohol in order to separate any ammonium sulphate with which it might be contaminated. On evaporating the alcoholic liquid, a small group of crystals was obtained. By dissolving the crystals in water, making the solution strongly alkaline with caustic potassa, and finally shaking with ether, the ether upon evaporation would yield the free base in quite a pure state. In this second examination I failed to obtain nicotine from *Cannabis indica*, but was successful with the tobacco.

In concluding my work I would answer the query by saying that nicotine is not present in *Cannabis indica*, in accordance with my investigation, but there is strong evidence of an alkaloid of some kind, as the tests above referred to, indicate. Recent investigations by others point in the same direction. (See National Dispensatory, 3d edition, p. 373.)

THE OIL OF PEPPERMINT.*

(*Oleum Menthæ Piperitæ.*)

BY ALBERT M. TODD.

In the paper which I have the honor to present to you, the history of the plant will be briefly noticed, and attention directed to some characteristics of the essential oil as observed in practical manufacture, some being of such phenomenal nature as to invite further investigation.

Mentha piperita, from which the true oil of peppermint is derived, was first introduced or noticed in Hertfordshire, England, and given the name "peppermint," by Ray, in his "Historia Plantarum," published in 1704. Its commercial history dates from about the year 1750, when its cultivation was commenced in a very small way at Mitcham, in Surrey, England. Fifty years later the amount under cultivation was about one hundred acres, but the growers having had as yet no distilleries built, still continued to convey the plant to London for the distillation of the oil.

The industry in England reached its zenith about 1850, just one hundred years after its introduction, when the area cultivated was about five hundred acres, but owing to successful American competition it was reduced during the next fifteen years to about two hundred and fifty acres. From personal observation when visiting the peppermint districts of England in 1875, I attribute the success of American competition to a more perfect system of distillation, and apparatus therefor, which I will again refer to, and the more healthful growth of the plants in our country. Distillation of oil of peppermint was first accomplished in America by a Mr. Burnet, in the year 1816, in the county of Wayne, State of New York, who collected on the banks of a little stream sufficient wild plants to produce about forty pounds of the oil. In the year 1835 the industry was established in Michigan, in St. Joseph county, on White Pigeon prairie, about two miles north of a village of that name, a distillery being erected the following year. Up to this time and for ten years later, the distilling apparatus used was very crude, being the same as had been used in England, with but few slight modifications,

* Read at the Fifth Session.

consisting of a copper kettle in which the plants were placed immersed in water, to which direct heat was applied by a furnace from beneath, a condensing worm of the usual character being connected with the kettle by a pipe from its apex.

The year 1846 marks a new and important era in the evolution of a more perfect system of distillation, and the apparatus therefor, viz., that of distillation by the diffusion of steam through the plants, which were now for the first time placed in large wooden vats, to which steam was conveyed by a long pipe entering at the bottom. The kettle which had been used heretofore as the still being now used for the generation of steam. Distillation was now effected in a much more perfect manner, as the scorching of the plants and the consequent formation of empyreumatic products was rendered impossible. Furthermore, distillation could now be conducted with much greater rapidity and economy. The primitive distilleries had a capacity of about fifteen pounds of essential oil in the twenty-four hours, the new form a capacity of seventy-five to one hundred pounds. This system of steam distillation originated in St. Joseph county, Michigan, and was soon introduced into New York.

I might state here that nearly every improvement in the construction of the stills has originated in St. Joseph county, Mich., and it would be of great interest to mark the further development of these improvements to their present high state of productions, but the limit of this paper renders it impossible. On some other occasion I may have the honor to give some practical and technical information relating to the methods of erecting the more perfect forms of distilleries.

Briefly as to the cultivation of the plants: In early Spring the ground having been ploughed, is marked out in furrows two and a-half feet apart. In these furrows are placed the roots and runners which have multiplied from the setting of the preceding year. One acre of good roots usually furnishes sufficient to set from five to ten acres of new ground. These roots and runners are from one-eighth to one-fourth of an inch in diameter, and from one to three feet in length, when in the healthy state. In setting they are carried in large sacks strung over the shoulders of the workmen, who place them in rows so that there shall be one or two living roots or runners at every point in the row. While placing the roots with their hands they at the same time cover them with their feet. It is quite an interesting sight, owing to the queer motions of the workmen, to see these roots planted. A good experienced workman can set about one acre per day in mellow ground with good roots. New plants appear above the ground about two weeks after setting, and are carefully hoed and cultivated until July or August, when, if the season is fair, the plants have thrown out such a quantity of runners as to render further cultivation very difficult and indeed unnecessary.

The proper time for distillation is when the plants are in full bloom.

In the case of the "new crop," that is, the crop which has been set the preceding spring, this usually occurs in September. What is known as the "old or second crop," which has sprung up spontaneously, from being the second year's growth, matures usually in August. For distillation, the plants are cut down and allowed to dry in the sun before being drawn to the distilleries. Many growers, however, believing that the plants sustain a loss of the oil by diffusion in the atmosphere if they are fairly dried, bring them to the still in the green state. As distillation can be effected with manifest rapidity from dry plants, this question of thorough drying is one in which the owners of distilleries and the producers in general have long been greatly interested. For if the plants are brought in in the green state, it will require, ordinarily, about ninety minutes for distillation, with a yield of perhaps five to seven pounds of oil to the charge; whereas, if thoroughly dried, distillation can be effected in about thirty-five minutes, with a yield of from eight to nine pounds, since the dried plants will pack much more closely in the vats than the green ones. Each owner of a distillery distills, on an average, the crops of ten other growers with his own, charging therefor twenty-five cents for each pound of oil obtained, whereas in England the charge is made for each vat of plants, whatever the amount of oil produced.

The former method is much more equitable for the grower, since if his crop is poor he is not obliged to pay an exorbitant rate per pound, and the latter method is more equitable for the distiller since it requires as much labor to distill a charge of poor plants as green and productive ones, and as stated much more when the plants are green.

To test the question as to whether a loss of essential oil occurred by diffusion in the atmosphere when the plants were thoroughly dried, I made a careful experiment, the results of which may be found in the September number of the "American Druggist." The dried plants used having been exposed to atmospheric action for six months and having been reduced by such exposure 49.4 per cent. in weight. As there are about fifteen thousand tons of the plants produced annually in America the settlement of this question is of material interest to owners of distilleries and growers; saving the former greatly in manufacturing and the latter in transportation.

The average yield of essential oil varies greatly, according to the quality of the plants, depending mostly on the fact whether they are fine and well covered with leaves and blossoms (in which the essential oil is entirely contained). The difference in quality of plants is so great that while from two thousand pounds of well leaved plants I have distilled eighteen pounds of essential oil, but one and one half pounds has been obtained in some instances from a like quantity of coarse plants, devoid of leaves. The average yield, however, is about one-third of one per cent. from green plants.

There are now in America about 175 small distilleries, where the natural oil is distilled. The average annual production in America for the last ten years has been about one hundred thousand pounds of oil. The average yield per acre of the crops of the first and second year is about eleven pounds; this would show an annual area under cultivation of about nine thousand acres.

As to the nature of the essential oil. Regarding this there are many tests which are so generally known as not to require notice at this time. Some of them, may however, be briefly stated. Oil of peppermint when freshly distilled, or when two or three years of age, if kept in well filled vessels, should dissolve readily in spirits in all proportions, making a clear solution without filtration. When a few drops of the oil are placed upon white paper and held over a lamp or gas jet, it should volatilize quickly and perfectly without undergoing change or leaving any residuum. When three drops of peppermint are placed upon four grains of resublimed iodine (or such quantity as will thoroughly saturate, but not drown the iodine) there should be but a slight reaction, and what little vapor is produced should be almost invisible, becoming entirely so after having risen about twelve inches above the mixture, the color of the vapor assuming a bluish cast. The color of the mixture in this test should be carefully noticed, which in the case of pure peppermint is of a brown, or a brownish black color, the iodine dissolving slowly and imperfectly. If oil of turpentine, erigeron, fire weed, rag weed or other terebinthinate oils are present there will be quite a violent reaction, (according to the quantity of the adulterant,) with the evolution of considerable heat a red or reddish-yellow vapor will be produced, of a rank odor, partaking considerably of the nature of the adulterant, and the mixture will change for a moment, at least, to a bright violet. If the color of the mixture is most carefully noted, a very slight quantity of such adulterants can be detected. When to 25 drops of alcohol one drop of nitric acid sp. gr. 1.200 with one drop of pure oil is added there will be produced, within about a half hour a blue or bluish-green color, which will remain permanent for a long time. Oil of pennyroyal and *mentha arvensis* produce no coloration. A much more intense coloration will be produced when one drop of nitric acid, of the strength as stated is mixed with fifty or sixty drops of the essential oil, without alcohol. Some specimens of oil of peppermint imported from Germany and England showed by this test admixture with *mentha arvensis*. To make this test valuable, however, to chemists and pharmacists they should first operate upon samples of known purity and notice the depth of coloration required.

Another test for the detection of pennyroyal, which also indicates *mentha arvensis* when in sufficient quantity is the following: Take one dram each chloral hydrate and c. p. sulphuric acid, adding twelve drops of alcohol. When this solution is mixed with a like quantity of pure oil

of peppermint, a dark cherry color is quickly produced and maintained for a long time. Pennyroyal (or oil of peppermint heavily adulterated with this oil) gives no such color, being more of a yellowish cast, and changing to an olive green.

When the test is applied to pennyroyal, a dull color is produced, changing to olive green. With *mentha arvensis* a yellowish brown color is produced, which is maintained for ten or twelve hours, and thirty-six hours later has a slight tendency to the cherry color or being intermediate between the cherry and the brown. It was noticed that when the true oil of peppermint was mixed with equal portions of the *mentha arvensis* a deficiency in the intensity of the cherry color was plainly noticed. Whether the significance, which I have discovered in these tests showing similar reactions in pennyroyal and *mentha arvensis*, proves relationship of the oils which the botany of the plants shows, is a question of interest.

I will now refer to the two physical tests, those of specific gravity and boiling point, of which the results in my experience, vary greatly from the tests published in official and standard works.

The difficulty, which scientific men seem to have experienced in establishing accurate tests for the purity of essential oils, has been that they could not conveniently obtain the plants from which they themselves could distill any specimens used in their investigations; and while undoubtedly every precaution possible was taken, the result shows, that they have in many instances operated upon impure samples; and although pure specimens undoubtedly were in some instances received, having no positive knowledge *per se*, which were pure and which were impure, too great a range of differences has been allowed in physical characteristics and chemical reactions. In correspondence with some well known chemists they give as their opinion that a wide range of specific gravity, etc., might result from variations in soil and climate. On account of this we took greater pains to verify our determinations by testing samples grown under varying conditions of soil and climate both in Europe and America. Forty-three samples were examined, including oils produced in St. Joseph, Wayne, Ionia Hillside and Kalhaska counties, Michigan, Wayne County, New York and vicinity (all of which were produced from American roots long acclimated), also one specimen grown in America from roots imported from England, and one specimen grown and distilled in England. The specific gravity has been variously stated in the dispensatories and other standard works at from .840 to .950 at 60° F. But there were none of the samples which were pure that had a specific gravity below .910 at 60° F., except the two last mentioned, grown from English roots, the one grown in America being .9085; the one distilled in England being .9088. Nor were any specimens of pure oil found taking the specific gravity above .917 which were in a perfectly soluble

condition. One sample distilled by myself in 1875 and consequently eleven years old, had on account of its age a specific gravity of .924; one sample from New York, .933 and from the same district .940. However, those three samples were found not to be readily soluble. The latter sample when submitted to rectification being found to contain 9 per cent. of insoluble resin. Of the five samples imported from Europe, but one was found pure; two from Germany were found to contain dementholized mentha arvensis; one from London, which bore a fraudulent and forged label (as Michigan Oil of Peppermint, Manufactured at Evart, Michigan County, U. S.) had a specific gravity .899. This oil when submitted to fractional distillation was found to contain *fifty per cent. turpentine, and no Michigan peppermint whatever*. The sample imported from London as German oil of peppermint, consisted chiefly of pennyroyal and mentha arvensis. Allowing a slightly wider range of difference than was really intended, it is evident that whether from English or American plants, pure oil of peppermint is never below .908 specific gravity, nor when fresh and soluble above .917 specific gravity, so that the difference formerly allowable, from .840 to .950 is made ten times as small.

As to the boiling point: This is stated in the Dispensatories at 365° F and 374° F. By placing the oil of peppermint in a distilling flask, the body of which was immersed in a mercury bath, the following times and temperatures were noticed, the distillate being divided into eight fractions: Applying the heat slowly, the *slightest possible* ebullition was noticed at 363° F., but so slight as to be almost imperceptible; ten minutes later the temperature had risen to 401.5° F., at which time *but two drams of fluid* were collected, *one-half of which was found to be water*. It will hence be observed that the true boiling point of the oil could hardly be placed below 400° F. Ten minutes later the temperature had risen to 406.9° F., with distillation progressing at the rate of but six drops per minute; and it was found upon reducing the temperature to 406° , that the speed of distillation was reduced to one drop in 42 seconds, so that the first fraction could not be recovered easily, except at a temperature higher than this. Counting from the time when the oil commenced to drop into the receiver the distillation of the first fraction of one ounce occupied fifty minutes, being concluded at a temperature of 412.8° F. It would seem then that the *true* boiling point should not be placed below 400° F.

I would here call the attention of the Association to the need of a more complete formula for recording experiments in fractional distillation, in which not only the form of apparatus and method of applying the heat should be noticed and the temperatures of each fraction, but also the speed at which it is effected in its various stages. This matter would form a very interesting matter for discussion.

I will now call attention to one phenomenal characteristic observed in

fractional distillation, and which I briefly alluded to one year ago, that is, the changes of direction from the *ascending* to the *descending* scale in the specific gravity of the different fractions. It was formerly supposed that the specific gravity constantly increased after the first until the last fraction was obtained. The law I discovered is that when the distillate is divided into a number of fractions the specific gravity continues to rise only until about half the oil is recovered, it then strangely commences to *descend* until 80 or 90 per cent. is obtained and a point is reached where the specific gravity is about as low as that of the third fraction. Now the direction again changes to a rising scale with great rapidity. To illustrate this I give you the specific gravities obtained in the distillation of three hundred pounds of oil of peppermint by the diffusion of steam. The times and temperatures and other conditions will be referred to in some future paper.

The specific gravities were as follows: The first fraction, 894.25; the second, 906.5; the third, 910; the fourth, 912.75; the fifth, 913.75; the sixth, 914; the seventh, 914.25; the eighth, 912.75; the ninth, 911.75; the tenth, 911; the eleventh, 910.75; the twelfth, 910.65; the thirteenth, 910.50; the fourteenth, 912.65. There are now recovered fourteen full fractions of twenty pounds each. There now remains in the still one full fraction of twenty pounds not yet recovered. Subdividing this fraction, the following specific gravities are found: The first five pounds is 925, the next two pounds 955, and the distillation being continued as far as possible, the last portion obtained is four ounces, specific gravity 970. There now remain in the still twelve pounds fourteen ounces resin, which if mixed with the seven pounds four ounces last obtained would raise the specific gravity of the last full fraction to about 980.

In calling the attention of Prof. Flückiger, of Strassburg, to the subject, he attributes it to the splitting up of the component parts. This, however, seems hardly possible when the aroma and chemical reactions of the fractions are investigated.

There are other tests and characteristics of interest which I would gladly notice if time permitted, but which will better form the subject of some future article.

DIOSCOREA BULBIFERA.*

BY J. U. LLOYD.

Herewith is submitted a curiosity to the members of the Pharmaceutical Association—a specimen of the aerial tubers from the Dioscorea

* Presented at the Fifth Session.

bulbifera. This plant is a native of Ceylon, but is now cultivated in some parts of the southern states. The specimen submitted herewith was obtained through the courtesy of Dr. J. F. Walker, of New Orleans.

Numerous species of dioscorea are cultivated in tropical countries for their tuberous roots, which are edible, containing a large proportion of starch. The dioscorea sativa is the most common one in the southern states, as the tubers are highly relished by the negroes, who call them yams. We have also a native species of dioscorea, the roots of which do not bear tubers, but on the contrary the rhizome is very hard and woody and is used in medicine under the common name *colic root* or *wild yam*. The special interest attached to the tubers presented is that they are borne above the ground, for, while a large number of plants have subterranean tubers, but very few bear them on the stem. We have a species of lily, also a few other plants, that have this habit, but it is comparatively rare in the vegetable kingdom.

MINUTES

OF THE

THIRTY-FOURTH ANNUAL MEETING.

MINUTES OF THE FIRST SESSION—TUESDAY AFTERNOON, SEPTEMBER 7TH.

The annual meeting of the American Pharmaceutical Association convened in Blackstone Hall, in the city of Providence, on the afternoon of Tuesday, September 7, 1886, when over one hundred members had registered. Through some delay in the delivery of necessary material, it was 3:45 p. m. before the meeting could be called to order. President Roberts in the chair and the other officers in their places.

The session was opened by the reading of the President's report, as follows:

GENTLEMEN OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

We come together this day in the good city of Providence to make record of the result of the gratuitous labor of the members of the Association for the past twelve months, and to strive with determined and continuous effort, to give such shape and direction to the management of its affairs as will best promote true pharmaceutical progress and most inure to the welfare of our profession and to public good. In this our thirty-fourth annual reunion we have to lament that since we last met together some of our colaborers have been called from among us, to pass that mysterious bourne toward which the footsteps of all tend, and yet from whence none return. Still, we have cause for thankfulness that so many have been permitted to meet and to renew our labors for promoting the usefulness of a profession that has for its object, as the handmaid of medicine, the best ally of the physician, in aiding him to combat disease, alleviate human suffering and prolong life.

The present depressed and unremunerative condition of pharmacy as a business does not, perhaps, fall strictly within the scope of this Association. Yet, in view of the fact that one of the most prominent causes of that depression is strictly pharmaceutical, it may not be amiss to allude to it in this paper. I refer to the large and increasing demand for proprietary medicines, which filches from the pharmacist so large a portion of his legitimate profits. Many of these preparations, it is true, reach the consumer through the pharmacist; yet, when we look around upon our shelves at the multiplicity of these medicines, we are compelled to carry in stock to meet business demands, and of which many are practically unsalable—the question of profit in handling the class of preparations referred to becomes a problem difficult to figure out. At the Hagerstown meeting of the Maryland State Pharmaceutical Association, some preambles and a resolution were passed, worded thus:

" *Whereas*, The rapid multiplication of that class of remedies known under the general head of proprietary medicines, works serious evils to legitimate pharmacy; and

" *Whereas*, The elegant dilutions presented to the public in the shape of elixirs and many other popular forms are very costly to the consumers and frequently of doubtful value; and

" *Whereas*, The Pharmacopœia furnishes ample choice of remedies to enable the physician to combat disease;

" *Therefore, Be it Resolved*, That the Maryland State Pharmaceutical Association most earnestly request its members to use their best efforts to induce physicians, when prescribing, to give preference to officinal remedies."

This resolution is a step in the right direction, but possibly does not go far enough. It is by the aid and countenance of physicians that this evil can be controlled and lessened. Physicians, if properly approached, will ever be found ready to aid and foster with their best efforts all measures in the interest of pharmacy that will inure to public good. If the intent of the resolution, amplified and indorsed by this Association, and possibly supplemented by the conjoint action of the various State Pharmaceutical Associations invoked by the direct appeal of this Association, were put into proper shape and brought to the attention of physicians by direct communication officially with the many medical associations throughout our land, I believe it would go far to correct the evil. The resolution should recognize the fact that the many preparations now in popular use that may be grouped under the head of so called "elegant pharmacy," have become such fixtures in our business that it will not do to ignore them, and embrace in its request that physicians confine their prescriptions to officinal, and such non-secret, non proprietary remedies as may be indorsed by, and the formula published from time to time under the sanction of this Association.

The numerical growth of this Association has not for the past few years been satisfactory. Among the causes of this waning popularity and consequent loss of usefulness may be found, I think, that tendency that has so strongly marked the management of this Association, to exclude from our proceedings everything other than strictly scientific pharmacy, or science pertaining thereto. To maintain the status of this Association as the national representative of the interests of the pharmacists of the United States, you cannot ignore any interest that pertains to either the science or the art of pharmacy, or that affects the welfare of pharmacists. In our occupation or profession the material are so interwoven with scientific interests that it is futile and unprofitable to attempt in such an Association as ours to separate them. To give popularity and full usefulness to the labors of this Association you must plant yourself upon Article I of your Constitution, and insist that the management see that the letter and spirit of that article are properly carried out. I would have the majority to so manage, as to fully control the working of the Association, and to inquire through proper committees or otherwise whether there be a better plan than that at present in use for its management. Do not understand me, gentlemen, as wishing to detract from the scientific labors of this Association. On the contrary, I would give more time and attention to them. But I would do so by refusing to permit the social features of our annual reunions from interfering with business. I desire to have the labors of this Association grasp every interest that pertains to either the science or the art of pharmacy. Let us even be sufficiently practical to notice and strive against the repetition of such outrages as have been lately chronicled in the sale of burnt and damaged drugs in the city of New York. Let us guard against permitting the management of this Association passing unduly into the hands of a few. Strive to maintain it upon a truly American basis, wherein every member is assured that whatever views he expresses, or whatever measures he advocates, will be weighed and their merits decided upon by the dispassionate judgment of his fellow-members.

Conceiving that this Association was intended by its founders to be an annual assemblage of pharmacists and other men engaged in kindred pursuits, for the purpose of giving heed, passing judgment and taking action on living pharmaceutical questions of the day, and to give them such form and indorsement as they seem to merit; further, that it was the intention of the founders of this Association to conduct its affairs at their own expense, both of time and money, hoping that when they halted in their labors those who succeeded them would willingly take up the burden, and in like manner conduct and manage its affairs, I cannot conceive that it is within the scope and intent of the objects of this Association that the present members of this body should tax themselves to accumulate a reserve fund for the purpose of fostering some indefinite purpose to be developed in the distant future; nor for what is far worse, the definite purpose foreshadowed by your Finance Committee (see page 523, Vol. 33 of our "Proceedings"). I place myself in antagonism to the recommendations of said committee, wherein it is proposed to accumulate a fund outside of those held in trust by the Association, of at least \$25,000, for the purpose and for the following reasons quoted from the report of the committee before referred to, in which they say: "It is desirable that an organization like the American Pharmaceutical Association should have a reasonably large fund on which it may be able to draw for such purposes as it may deem proper. Such a fund gives stability and prominence to a society, and many times affords the means for relieving it from embarrassing situations. Such a fund is also a means of attracting and holding good members, and thus serves as a helpfulness in our work." They say further: "In the future it may help to relieve the Association in the somewhat puzzling matter of our annual entertainments," and add: "Your committee might go on and multiply reasons for their recommendations, but deem the above sufficient." I agree with the committee that their reasons are sufficient *in number*; but they are certainly very Pickwickian if aimed at any particular conclusion.

To recur to the reasons offered for the accumulation of this proposed reserve fund, we have first in order: "That it is desirable that an association like the American Pharmaceutical Association should have a reasonably large fund to draw from as it may deem proper." I take the converse of this proposition, and say that it is desirable that the affairs of this Association be so managed as to enable it at all times to pay its current expenses, and that any fund accumulated beyond what is required for the easy working of the machinery of the Association will prove to be an incentive for unnecessary and extravagant expenditure, and possibly a source of corruption that may disrupt the Association. You may depend, gentlemen, that "pay as you go" is the safest rule both for individuals and for this Association;—that it is wise for us to pay our way as we go, and to let posterity do the same, or otherwise, as they may elect. I do not believe it is either wisdom or good policy for the members of this Association to draw upon their hard earnings to hoard a fund to be used, or misused by their successors.

The second proposition of your said committee is: "That such a fund gives stability and permanence to a society, and many times affords the means of relieving it from embarrassing situations." This is a very pretty sentence as it stands. The irony of it is charming. That it was intended by the committee in an ironical sense will be apparent when I quote the last sentence of the same report, which reads thus: "Your committee feel that, as is the case with an individual, so there is danger to an association when its financial strength is over-estimated." If the murkiness of this last proposition of the committee can be seen through, it would seem that this committee had a just and wholesome dread of even seeming wealth. But how or why, when foreseeing such danger from merely imputed wealth, they can in the same report advise the accumulation of this special fund of not less than \$25,000, is past my conception. I impute no wrong motives to the committee, but believe in advising as they have done, that they conceived they were

acting as they thought the best interests of the Association demanded. I believe the committee err, and if their advice be adopted, and this proposed fund created, that it will be fraught with danger to the stability and harmonious working of our Association; that it might bring into this Association members who would work for pelf, to displace those whose bond to the Association is but to foster the best interests of pharmacy.

Their third proposition is: "That such a fund is also a means of attracting and holding good members, and thus serves as a means of helpfulness to our work." This sentence, taken in connection with the reasons given by the same committee in the same report, when arguing in opposition to the abolition of the initiation fees, leaves the mind in doubt as to what constitutes in the opinion of the committee "pharmacists whom it is desirable to have as members." The committee in their report use this language: "The initiation fee and annual dues as at present fixed are not a burden to the individual members of the Association, nor do they prevent healthy increase of membership from that class of pharmacists whom it is desirable to have as members; nor do your committee know that there is any general complaint regarding the same." (Article I of our Constitution defines the class of pharmacists whom it desires to unite, and the objects for which it aims to unite them. Further than that constitutional allusion, I think it unwise in our proceedings to draw any distinctions.) This statement of the committee, taken in connection with a motion now pending to alter the Constitution so as to convert the money received from initiation fees into a permanent fund, the interest alone to be used for current expenses, shows that the necessity for these initiation fees has passed by, and shows, further, that a portion of our members are anxious to take this new departure and embark in the creation of a large reserve fund to be used for some future and undefined purpose.

The committee state that the annual dues and initiation fees do not prevent a healthy growth. What constitutes healthy growth? If 176 new members in 1880 is healthy growth, do the committee consider 40 new members in 1884 in the same light? The ratio should certainly be upon the ascending scale, not descending, to be healthy. That the initiation fees and annual dues exacted may have nothing to do with this slow increase is very possible. But, on the other hand, it may be one of the cumulative causes that in the aggregate have most potent effect.

To return to their third proposition—what constitutes in the mind of the committee "that class of pharmacists whom it is desirable to have as members." Do they desire to ostracise and declare all as unworthy of membership who are not blessed with sufficient worldly goods to be able to contribute to this proposed reserve fund? Do they wish to make money a standard to estimate the value of an associate? If so, with all due deference to the committee, I tell them that it is the unpaid, the volunteer labor of our members, the labors undertaken out of pure love of fostering true pharmaceutical progress and the best interest of pharmacy, that has made the American Pharmaceutical Association what it is. It is the unpaid, volunteer labor of our members that will make its future, and this Association should be very careful in barring its door against any worthy pharmacist because of his impecuniosity, and put as few impositions upon the entry of such as the actual needs of the Association permit.

The last proposition of said committee is in these words: "They would suggest that such a fund may in the future help to relieve the Association in the somewhat puzzling matter of annual entertainment." How this reserve fund of \$25,000 or more is to help solve this puzzling matter of annual entertainments the committee do not say, although outside intimations whisper that they propose to provide free entertainments to some future generation. If this outside whisper truly represents the object or one of the objects for which this fund is proposed to be raised, I object to it, both as an equitable, and a business proposition, and suggest that posterity pay its own expenses. There has

been no period in the past history of this Association when it more truly represented the purposes for which it was instituted, and when we found time both for work and reasonable entertainment—no period when more cordial feeling existed among our members—than when we depended upon the native hospitality of our brother pharmacists at the place of meeting. I venture this assertion in no spirit of fault finding or discourtesy to the committees of entertainment, who spent much time and effort, to please, when I state that their efforts were not crowned with the hoped-for success, and add that it is almost an impossibility to restrain the hospitality of a people, nor do I think it desirable to make the attempt. I therefore advise that no future tax be levied upon the members of this Association for entertainment. This self-inflicted tax does not prevent the pharmacists of the cities wherein this Association meets from being called upon to contribute largely for purposes of entertainment. For the general truth of this proposition I name the meetings at Washington and at Pittsburgh. In both localities hospitality drew largely upon the local purse.

In matters of initiation fees and annual dues, my recommendation will follow and confirm that of my two immediate predecessors. I advise that the initiation fee be abolished; that the annual dues be so proportioned and lessened as but to yield such sum as in the judgment of the council may be sufficient for the liberal support of the Association. I note a proposition to amend Article IV of the Constitution, so as to add the money received from entrance fees to a reserve fund. As this proposition to amend is backed by such names as Prof. Jno. M. Maisch and Albert E. Ebert, I feel great hesitancy in objecting to it. Yet, as it seems to me that this proposed diversion of the initiation fees from the funds used to pay our current expenses is wrong, I advise that the proposed amendment be not adopted, and again enter my protest against the accumulation of a large reserve fund as being fraught with danger to the integrity and the best interests of this Association. Even the small funds that have been set aside for special scientific purposes have as yet borne but little fruit, the history of these small specific funds thus serving as another strong argument in favor of the position that it is to the unpaid, volunteer labor of our members that we must look for the support, for the success of this Association. To my mind the true manner to increase the influence, the usefulness of this Association, is to aim through persistent effort to bring within our fold the majority of the pharmacists of our land. If we can by a liberal and just line of policy enlist the countenance and support of the majority of the pharmacists of our country, we will have achieved the position in which our Association will work the greatest good for progressive pharmacy and confer the most marked benefits upon pharmacists individually. If you can but secure the moral and pecuniary support of the majority of the pharmacists of the United States, and I believe that it is possible to do so, you would have something better than a reserve fund to draw upon. You would have a perennial fund that would be never failing as a source from whence to draw for every legitimate need of the Association. You would have but to name the object, and if that object was such as to commend itself to the general approval of your fellow-pharmacists the necessary contributions would as surely follow as day does night. I again record myself as opposed to the creation of a reserve fund and in favor of a perennial fund, to be created by such wise and liberal effort as will greatly increase our membership and give to this Association the control of the influence and the purse of the majority of the pharmacists of the United States.

State Pharmaceutical Associations, that have so largely increased within the last few years, furnish a new factor in progressive pharmacy. Some see in their multiplication something that is inimical to this their parent Association. On the contrary, to my mind they afford a field that properly worked gives promise of a grand harvest; that these State Associations in their fealty to progressive pharmacy—or, if you like the term better,

to aggressive pharmacy—will prove adjuncts and aids to this Association, giving it both moral and numerical support. As one of the many methods of maintaining those intimate relations and that cordial feeling that should exist betwixt the State Pharmaceutical Associations and this Association as their national representative, adding strength and usefulness to both, I suggest as worthy of trial that a series or set of questions be instituted entirely separate from the usual queries that are propounded to, and answered by our members individually. Let these questions be so shaped as to bear more particularly upon the business interests of pharmacy. Let this Association make direct appeal to the several State Associations to appoint committees to consider and report upon such queries as may be assigned to them. If my theory is correct, the several State Pharmaceutical Associations will gladly appoint the committees as requested; and, further, that the said associations will in a spirit of generous rivalry see that their most able workers are placed upon these committees, and thus insure such reports as will inure to the usefulness and credit of this Association. Moreover, such reports, being the acts of the several State Pharmaceutical Associations, would serve as a valuable index of the wishes and views of the localities they represent, and be a guide to our Association in shaping their legislation so as to command general approval. Again, I would advise, that the said State Associations be officially invited to communicate with this Association in their corporate or State capacity upon any and all questions of pharmaceutical interests that may seem to them of national importance. I further advise that a new committee be created, to be known as the Standing Committee on State Pharmaceutical Associations, whose duty it shall be to devise and submit from time to time for the consideration of this Association such measures as said committee in their judgment think will serve to promote and preserve that harmony of action and intimate relation that should exist between associations that are working with a common purpose in a common cause and for common good. I can see no good reason why some such bond of union, some such intimate relation, should not exist between the several State Pharmaceutical Associations and this their National Association, as do exist between the several States of our Union and the Union of the several States that has given to the world a nation of which we are so justly proud. Maintaining to the several State Pharmaceutical Associations full control in all local interests, and yielding to this their National Association the more important issues, this Association would thus fulfill its highest mission and serve as a bond of union twixt the several State Pharmaceutical Associations—would be both strengthened itself and add to the strength and efficiency of the State Pharmaceutical Associations. It will take time, prudence and patient labor upon the part of this Association to avail itself fully of the support of the State Pharmaceutical Associations. But these associations seem to me to offer a tempting field of reward in aid of true pharmaceutical progress—a harvest that will enrich alike those who garner it, and those from whose field it is reaped.

Considerable time passes after each annual session before our Proceedings are printed. This delay is inherent in the work performed, and yet gives some dissatisfaction. To remedy this evil let our proceedings be considered but as a volume for reference, and it will not matter whether they appear a month or so sooner or later. Then look to the pharmaceutical journals to give to our members and to pharmacists at large full and prompt accounts of our proceedings. To this end I advise that every facility be accorded to the pharmaceutical journals to enable them to make full and accurate reports of our proceedings. You will thus, while cultivating the most friendly relations with said journals, enlist their best efforts in popularizing and extending the usefulness of this Association. Let us not adopt a restrictive policy, or drop one that is generous, and befitting an association laboring in behalf of science and pharmaceutical education.

I suggest and advise that our By-laws be so amended as to create an additional stand-

ing committee, to be known as the Committee on Revision of the Pharmacopœia; that it shall be the duty of this committee to collect and make record of all suggestions for improvement of the Pharmacopœia that may seem valuable; that it shall be their further duty to submit to this Association at each annual session a detailed report, so that the result of their labors may be held fully under the supervision and advisement of this Association; that it shall be the further duty of this committee to make the report handed to this Association at the meeting next prior to the meeting of the convention for the revision of the Pharmacopœia, such a detailed, cumulative report of their labors as will fully express the desires of this Association, and give to the convention of revision a correct and business-like statement of the wishes of the pharmacists of the United States. I assume that the final report of this committee, representing their cumulative labors from one period of revision to another, the fact that their labors had been under the annual supervision of this Association, that their final report presented as the will of this Association, would be a fair representation of the actual status of pharmacy at the time, and the wishes of pharmacists throughout our land; that a pharmacopœia founded upon such a basis would so intelligently represent pharmaceutical interests, as to commend itself to the general approval and observance of all.

I suggest that our By laws be further amended so as to provide that no elected member of the Council be eligible to re-election within one year after the expiration of his term of office. This proposition would not affect those members of the Council who hold office therein *ex-officio*. The proposition is made in no spirit of distrust of the Council or any member thereof, but in antagonism to that tendency to centralization of the powers of this Association in the hands of a few—a tendency that is common to all associations; and it is to guard against this evil that I suggest such alteration in our By-laws be made as to hold to the majority of the Association at all times an intelligent and direct control over their own affairs. I care not how well any officer or set of officers may do their duty; if they hold position long there will be fault found with them that will weaken their efficiency and create a want of harmony in the body of the Association.

I direct attention and the consideration of this Association to a motion made by Mr. Ebert in the Council, and by said Council referred to this Association for action. (See page 524, Vol. 33, of "Proceedings.") The resolution referred to reads thus: "That a committee be annually appointed, to be known as the Committee of Materia Medica or Pharmacognosy, to consist of five members, whose duties it shall be to investigate and report annually on the origin, source and value of new remedies, such as are brought to the notice of the medical and pharmaceutical professions, the committee to represent the different sections of the country." I believe such a committee properly constituted would labor most usefully in the interest of the public and the medical profession in unmasking the shams and sophistries of too grasping manufacturing pharmacists, who in their business enterprise too frequently impose through specious advertising and solicitation upon the public many new, doubtful and frequently useless remedies, and at high cost. I heartily commend Mr. Ebert's motion to your attention, and trust his proposition will be adopted.

There is but one other feature in connection with pharmacy that I will allude to: that is, the rather rapid multiplication of Colleges of Pharmacy. That Colleges of Pharmacy may be multiplied without detriment to the status of pharmacy is a truism that none will deny, provided, however, that they maintain that high and ascending scale of qualifications of the students of pharmacy that all friends of true pharmaceutical progress have for many years past demanded should as a rule be observed in their education. For surely, as the opportunities for acquiring knowledge afforded the student of pharmacy are multiplied, so should a demand for greater proficiency be exacted from them. It is from a fear that a rapid increase of colleges of pharmacy may beget,

in spirit of commercial rivalry, a competition for students that might lower the standard of excellence demanded of them, in my opinion it will be wise for all well-wishers of our profession to hesitate; and to be well assured that there be an actual need of a new college of pharmacy in the locality in which it is proposed to establish it, before lending their aid and countenance to the project.

In conclusion, gentlemen, permit me to assure you that my criticisms and recommendations have been conceived in what to my mind seemed likely to promote the best interests of this Association. To your judgment and decision these are respectfully submitted.

Mr. Macmahan moved that the address be referred to a committee consisting of ex-Presidents Thompson, Markoe and Saunders, for consideration and report.

Mr. Menninger moved to amend that the committee consist of all the ex-Presidents of the Association now present.

Mr. Ebert urged that the President appoint such a committee consisting of three members. This was moved by Mr. Nicot as an amendment, and the amendment was agreed to by a vote of 57 ayes to 38 nays. The motion as amended was then adopted without dissent, and the President appointed on this Committee Messrs. W. S. Thompson, Washington, D. C., A. E. Ebert, Chicago, and S. A. D. Sheppard, Boston.

The Secretary read the report on delegations, showing that up to August 24th, thirty credentials had been received by him in compliance with Chapter viii. Article vi. of the By-laws, and that to the present time, including those handed in at the present session, credentials had been received as follows:

From Colleges of Pharmacy.—Chicago, Cincinnati, Louisville, Maryland, Massachusetts, Montreal, National (Washington, D. C.), New York, Ontario, Philadelphia, St. Louis.

From State Pharmaceutical Associations.—Alabama, California, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Texas, Virginia, Wisconsin, and Province of Quebec.

From County or City Associations.—Allegany Co., N. Y.; Cleveland, O.; King's Co. N. Y.; Lancaster Co., Pa.; Norfolk and Portsmouth, Va.; Richmond, Va.

From Alumni Associations of the Colleges of Pharmacy of Louisville, Massachusetts, New York, Philadelphia, Pittsburgh, St. Louis, and University of Michigan.

Credentials were also received from the National Wholesale Druggists' Association, accrediting Messrs. Thos. F. Main, of New York, Wm. B. Blanding, of Providence, W. J. M. Gordon, of Cincinnati, and E. Waldo Cutler, of Boston, a committee to visit this Association.

The following telegram was read:

CHARLESTON, S. C., September 6, 1886.

JOHN M. MAISCH, SECRETARY AMER. PHAR. ASSOC.:

Sorry cannot be with you. My family escaped alive. Our home is destroyed.* We are camping. Kind remembrances.

G. J. LUHN.

* This has reference to the recent earthquake.—EDITOR.

Mr. Bocking reported that the West Virginia Pharmaceutical Association was no longer in existence.

Reports of Committees being called for, that of the Committee on Drug Market was read by title by Mr. M. N. Kline, who had prepared it in place of Messrs. A. H. Jones and L. Lehn, of whom the former declined to serve as chairman, and the latter was absent in Europe. The other Committee reports read by title were on Papers and Queries, on Legislation, and on Unofficial Formulas.

Mr. Ebert gave notice of an amendment to the By-laws abolishing the Committee on the Drug Market as a standing committee of this Association.*

For the formation of the Nominating Committee, the delegations made the following appointments:

FROM COLLEGES OF PHARMACY.

<i>Chicago</i> .—A. E. Ebert.	<i>National</i> (Washington, D. C.).—W. S. Thompson.
<i>Cincinnati</i> .—T. L. A. Greve.	<i>New York</i> .—T. J. Macmahan.
<i>Louisville</i> .—C. L. Diehl.	<i>Ontario</i> .—Wm. Saunders.
<i>Maryland</i> .—Wm. Simon.	<i>Philadelphia</i> .—Henry Trimble.
<i>Massachusetts</i> .—G. F. A. Markoe.	<i>St. Louis</i> .—J. N. Tomfohrde.
<i>Montreal</i> .—L. R. Baridon.	

FROM STATE PHARMACEUTICAL ASSOCIATIONS.

<i>Alabama</i> .—P. C. Candidus.	<i>Nebraska</i> .—N. A. Kuhn.
<i>California</i> .—E. Painter.	<i>New Hampshire</i> .—C. A. Tufts.
<i>Connecticut</i> .—H. H. Osgood.	<i>New Jersey</i> .—E. A. Sayre.
<i>Georgia</i> .—J. Ingalls.	<i>New York</i> .—W. P. De Forest.
<i>Illinois</i> .—C. W. Day.	<i>North Carolina</i> .—Jas. C. Munds.
<i>Indiana</i> .—J. H. Andrews.	<i>Ohio</i> .—J. D. Wells.
<i>Iowa</i> .—Rosa Upson.	<i>Pennsylvania</i> .—J. H. Redsecker.
<i>Kansas</i> .—Geo. Slosson (in place of delegation).	<i>Rhode Island</i> .—E. C. Danforth.
<i>Kentucky</i> .—H. H. Rademaker.	<i>Texas</i> .—E. W. Lancaster.
<i>Massachusetts</i> .—J. W. Colcord.	<i>Virginia</i> .—T. Roberts Baker.
<i>Michigan</i> .—(None present.)	<i>Wisconsin</i> .—A. H. Hollister (in place of delegation).
<i>Minnesota</i> .—Karl Simmon.	<i>Province of Quebec</i> .—R. McLeod.
<i>Missouri</i> .—M. W. Alexander.	

In addition to the foregoing, the President appointed the following members from those not coming as delegates: Joseph P. Remington, Philadelphia; E. Bocking, Wheeling, W. Va.; R. H. Vansant, Trenton, N. J.; H. S. Wellcome, London, England; and Leo Eliel, South Bend, Ind.

Mr. Remington introduced Mr. Alfred H. Mason, of Montreal, a member of the British Chemical Society and of this Association, and Colonial Secretary of the British Pharmaceutical Conference, and moved that as

* The amendment was not called up for action.—SECRETARY.

a member of the latter body, fraternal greetings be extended to him and the privileges of the floor. The motion was adopted unanimously.

On motion of Mr. Macmahan an invitation was extended to the physicians of Providence, and to all druggists present who are not members, to attend the sessions and participate in the discussions.

The Secretary of Council, G. W. Kennedy, read the minutes of that body, covering the time since the last annual meeting, which on motion were approved. The minutes of the fourth and fifth sessions of Council are printed in the Proceedings of 1885, page 581. The minutes of the remaining sessions give the following information:

SIXTH SESSION, PROVIDENCE, SEPTEMBER 6. (11 members present.)

The Secretary reported that in compliance with the votes taken by correspondence, the phototype of the late H. B. Parsons had been procured for the last volume of the Proceedings; and that 5000 circulars and blank applications had been sent out to non-members.

The report on membership was read, accepted and referred.

On motion of Mr. Saunders, Mr. Wm. S. Thompson was requested to bring before the Association, at the general session on Wednesday, the subject of the introduction into America of foreign medicinal plants for the purpose of obtaining the views of members and eliciting information regarding such plants as would be desirable to cultivate in this country.

The Treasurer presented his annual report, which for the present was laid on the table; and the Examining Committee on the Treasurer's books having reported progress, were granted further time to complete their labors.

SEVENTH SESSION, PROVIDENCE, SEPT. 7. (13 members present.)

The Treasurer's report was taken from the table and referred to the Examining Committee.

The following reports of standing committees were read, accepted, and referred to the Association: On Publication, on Centennial Fund, and on Finance.

The Permanent Secretary's report on credentials was read, examined by a committee, and then accepted and referred to the Association.

The names of nineteen candidates for membership were presented, and after examination referred to the Association.

A number of applications from societies and various institutions were received and referred to the Committee on Publication for action; likewise a communication in relation to the portrait of a deceased member for the next volume.

The reports of the special committees on the publication of a periodical under the auspices of the Association (see Proceedings 1885, p. 525), and on the separation of the business sessions of the Association from the scientific sessions (see Proceedings 1885, p. 581), were presented in the form of amendments to the By-laws of the Association, and for want of time to consider them, were referred to the new Council.

The Committee on Reducing the Expenses of the Association (see Proceedings 1885, p. 581), presented a report which was accepted and referred to the Association.

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association.

GENTLEMEN.—*Your Committee, through its Chairman, would respectfully submit this, their annual report.*

You will observe by the following statement that the membership of the Association during the past few years has not increased as rapidly as your committee would desire, and that there has been a gradual falling off in new members for some time back. Last year but 35 were added to the roll, the smallest increase in any one year since I first became Chairman of the Executive Committee and (since the Council was established) Chairman of the Committee on Membership, the first position dating from the meeting held in Louisville, Ky., in 1874, serving the Association in these positions during the period of 12 years. At the Louisville meeting 78 members were elected; in 1875, at Boston, 154; in 1876, at Philadelphia, 148; in 1877, at Toronto, Canada, 52; in 1878, at Atlanta, Ga., 63; in 1879, at Indianapolis, 102; in 1880, at Saratoga Springs, 176; in 1881, at Kansas City, 147; in 1882, at Niagara Falls, 128; in 1883, at Washington, 90; in 1884, at Milwaukee, 40; and in 1885, at Pittsburg, 35. I sincerely hope that the increase this year will be larger than it has been for some years back. Every effort has been made by the Association, with this object in view, by sending to pharmacists blank applications and circulars, explaining the object of the Association and its many advantages to apothecaries. This work has been kept up since 1880, at which time a special committee on membership was appointed, distributing 7,000 blank applications. The following year the Committee on Membership sent out 10,000 applications and circulars to different sections of the country, and every year since 5,000 of each have been sent out, excepting one year when 6,000 were mailed to pharmacists residing in states near the place of meeting. You will notice that the Association has spared neither expense nor time in this particular direction.

It cannot be said that this work has not resulted in some good to the Association, for it has, but not, peradventure, as much as was anticipated; it has, however, kept our organization prominently before pharmacists during this period, and if they fail to join us this year, they may at a subsequent meeting, as some have done. There is no doubt but the many State Pharmaceutical Associations which have been organized in the past few years, interfered to some extent with the growth of our Association.

REPORT OF MEMBERSHIP.

Members in good standing at last report.	1324
Members elected at last meeting	34
Became members by signing the Constitution and By-laws	1
Total membership	1359

LOSS IN MEMBERSHIP.

By resignation	18
Dropped from roll for various causes	27
By death	20
Total loss	65
Number in good standing at this report	1294

HONORARY MEMBERSHIP.

Number on the roll at last report.	27
Loss by death.	1
Remaining at this report	26

A vote was taken by correspondence on the motion that the usual number of blank applications and circulars be issued, the expense not to exceed \$125. In compliance with this, your Committee distributed circulars and blank applications to the number of 5,000, to pharmacists residing in Maine, Vermont, New Hampshire, Connecticut, Massachusetts, Rhode Island, and New York. The expense incurred to the Association was as follows:

Postage	\$50 00
Printing circulars, applications, and envelopes.	49 00
Printed addresses and labor	12 47
Total expense.	\$111 47

The circulars were similar to those of last year, with some slight modifications.

A number of applications for membership have thus far been received, and will be reported for election at the proper time.

I herewith submit a long list of names of members who are liable to be stricken from the roll for non-payment of dues; some of them no doubt will pay up before the next volume of Proceedings is ready for distribution.

It is with feelings of unmingled sadness that I again assume the solemn duty of paying the memorial tribute to those of our number who have passed "through the valley of the shadow of death" to join the innumerable throng of those who have "gone before." The destroying angel has invaded our ranks with a merciless hand; some have been borne down with the weight of many years of faithful service, others have fallen in the flush of middle age, in the midst of their usefulness to their profession and the world, while a few have been cut down almost upon their entry into their chosen field of labor, and where their talents bespoke for them a bright and useful future. These are to us strong reminders that the strong of to-day are the weak of to-morrow, and that while we are laboring to the end that human suffering may be brought under the power of God's remedial agents, we all are mortal, and sooner or later, one by one, shall follow our brethren to the silent city of the dead.

The names of our dead members are as follows, some of these appear on the list of deceased members in the last Proceedings. *Edward T. Meyers*, Bethlehem, Pa.; *F. M. Bassett*, Brooklyn, N. Y.; *Jefferson Oxley*, Nicholasville, Ky.; *Edward S. Wayne*, Cincinnati, Ohio; *Geo. S. Knight*, Bath, N. Y.; *I. W. Blunt*, Richmond, Va.; *H. S. Evans*, Montreal, Can.; *Junius Gridley*, New York; *Jos. J. Karch*, Lebanon, Pa.; *John G. Campbell*, Corsicana, Texas; *Stephen Webster*, Boston, Mass.; *Stephen F. Penrose*, Quakertown, Pa.; *Jacob W. Burdge*, New York; *James J. Benedict*, Cleveland, Ohio; *G. M. Baker*, Brooklyn, N. Y.; *Henry Sweet*, Chicago, Ill.; *Chas. Faust*, Cincinnati, Ohio; *John B. Ruble*, Canton, Ill.; *Chas. A. Merrill*, Exeter, N. H.; *Wm. C. Bakes*, Philadelphia, Pa.; *Asher C. Nagle*, Youngstown, Ohio; and *Cavour Niccola Sinimberghi*, of Rome, Italy, the latter an honorary member of this Association and one of the most prominent and best known of Italian pharmacists.

Edward T. Meyers of Bethlehem, Pa., died there September 21, 1885, of consumption of the bowels. Mr. Meyers was born at Lititz, Pa., March 17, 1832, and was consequently fifty-three years and four months old at the time of his death. He spent his youth as a student of Beck's Academy for boys at Lititz. At the age of seventeen years he moved with his parents to Columbia, Pa., where he entered the employ of R. Williams, druggist. At the age of twenty years he went to Philadelphia, where he entered the pharmacy of E. B. Garrigues, and attended lectures at the Philadelphia College of Pharmacy. After having had charge of a drug-store in Phoenixville for one year, he went to Bethlehem in 1856, and engaged in the drug business very successfully. In 1859 he married Lydia A. Bough, of Phoenixville, who, with a daughter, died in 1862.

In 1864, he married Miss Louisa M. Traeger, of Bethlehem. Deceased was an active member of the Pennsylvania Pharmaceutical Association. He was an excellent druggist, and took a lively interest in every movement to advance the standard of his profession. Deceased became a member of our Association at the meeting held in New York in 1867.

Francis M. Bassett, of Brooklyn, N. Y., died in September last of paralysis, aged 65 years. Deceased was born in England, but was sent to Paris at the age of fifteen, where he was educated for the profession and became a graduate in pharmacy. After receiving his diploma he remained in Paris a number of years, but finally came to this country and located in Brooklyn, where, after several changes, he bought the store corner of Court street and Atlantic avenue. He retired from business about five years ago. He was a good, conscientious and reliable pharmacist. He was never married. Deceased was a life member (old style) of our Association, and connected himself with it at the meeting held in New York City, in 1860.

Jefferson Oxley, of Nicholasville, Ky., died there October 11th, 1885. Mr. Oxley was born in the town of Cynthiana, Ky., 1842, and was therefore in his forty-fourth year. He began the study of pharmacy in Paris, Ky., graduated from the Philadelphia College of Pharmacy in 1872, subsequently went to Georgetown, Ky., and in the year of 1872 removed to Nicholasville, Ky., where he remained up to the time of his death, and at which place he married Miss Laura Hemphill, who survives him with three small children. Mr. Oxley was prominent in his profession, being considered one of the most accomplished and reliable druggists in his state. He had been for a long time an active and influential member of the Kentucky State Pharmaceutical Association, having served on many important committees, and last year served as its president. He took a deep interest in the progress of pharmacy in his state, and labored assiduously to induce the legislature to elevate the standard of efficiency among the druggists. His reputation as a trustworthy pharmacist was known all over the state. Aside from his profession Mr. Oxley was a man of great public spirit, and took a strong interest in all matters pertaining to the advancement and improvement of his town. Mr. Oxley became a member of our Association at the meeting in Atlanta, Ga., 1878.

Edward S. Wayne, of Cincinnati, Ohio, died in Philadelphia, December 11, 1885, aged sixty-seven years. He learned the drug business in Philadelphia with Frederick Klett, whose well-known store was located at the corner of Second and Callowhill streets. At the age of 17 years, in the year 1835, his apprenticeship began, and ten years later he entered into partnership with a nephew of Mr. Klett, Mr. Samuel Pleis, forming the firm of Wayne & Pleis at Cincinnati. Subsequently Mr. Wayne was in charge of the prescription department or of the laboratory of several Cincinnati houses like A. Zeller & Co., F. E. Suire & Co., and J. S. Burdill & Co. The organization of the Cincinnati College of Pharmacy was furthered in every way by Mr. Wayne, whose reputation and skill as a pharmacist and chemist caused him to be made one of its professors, and it was particularly in the chair of Materia Medica that his labors met with signal success. Being a fluent and pleasant speaker, a skillful experimenter, and a careful observer, his lectures were made particularly interesting through his long and successful laboratory experience. In 1852 he was appointed a delegate by the Cincinnati College of Pharmacy to the Convention in Philadelphia, by which our Association was organized, but was unable to attend this meeting. Mr. Wayne was an associate member of the Philadelphia College of Pharmacy, an honorary member of the British Pharmaceutical Conference, and of other scientific bodies. He served as Recording Secretary, as Vice-President, and on many important committees in our Association. He contributed many valuable papers to our Proceedings, to the "American Journal of Pharmacy," and to other pharmaceutical journals. In the year 1854 he was elected a member of our Association at the meeting in Cincinnati.

George S. Knight, of Bath, N. Y., died there of typhoid fever, March 27, 1884. Mr. Knight was born near Lodi, Seneca county, September 6, 1847, and at the time of his death was in his 37th year. In 1868 he went to Bath as a drug clerk for L. J. Wheeler. In 1872 he succeeded to the business, and up to the time of his death conducted it. As a pharmacist and citizen he won the respect and esteem and confidence of all, through earnestness and devotion to his chosen work. His remains were taken to his birth place for burial. Mr. Knight joined our Association at the meeting held at Saratoga Springs, in the year 1880.

Ira W. Blunt, of Richmond, Va., died there June 25, 1886, at his residence, of pneumonia. The deceased was born in Chesterfield county, Va., February 5, 1832, and was therefore at the time of his death fifty-four years of age. At an early age he became connected with the drug house of Adie & Gray, where he remained till 1860. In 1871 he again entered the drug business, and when Mr. M. S. Valentine introduced his meat juice, he accepted a position with him, which he held to the day of his death. Few men were better known in Richmond than was Ira W. Blunt. He was a devoted husband, a true man, and a faithful friend. He was trusted implicitly, and repaid the confidence reposed in him by an unselfish devotion to his work, that had frequently to be checked by positive command. He was open-hearted and open-handed, was never so happy as when contributing to the pleasure or relieving the pain of others. Mr. Blunt became a member of our Association in 1873, at the meeting held in the city of Richmond, Va.

Henry Sugden Evans, of Montreal, Canada, died in February last of pneumonia, in the city of New York, after a few days' illness. Mr. Evans was formerly one of the well-known firm of wholesale druggists in London, Liverpool, and Montreal, which under some changes of name have included members of the Evans family—at present, Evans, Sons & Mason, of Montreal. He retired from that firm a year or more ago, and since that time filled the position of Government Analyst at Ottawa. He was a member of the British Pharmaceutical Conference, and of several other scientific bodies in England and Canada. He was elected a member of our Association in 1880, at Saratoga Springs, New York.

Junius Gridley, of New York, died suddenly at his home Friday evening, March 12, 1886. He had been ailing a little during the past year or two, and on that day had been apparently in most excellent spirits and business. After dinner at his home, a sudden coughing spell came on, and though a few moments later a physician was called in, he suddenly expired, the immediate cause of his death being heart trouble. Mr. Gridley was at one time actively engaged in the wholesale drug business, but afterwards became identified with the Phoenix Chemical Works, largely engaged in producing the mineral acids. He was also interested in several other industries of magnitude. A most genial friend, a consistent business man, beloved by all who knew him, is the testimony of all. He was a life member (old style) of our Association, becoming a member at Cincinnati, in 1854. He leaves a widow, one son, and one daughter, to mourn their loss.

Joseph J. Karch, of Lebanon, Pa., died in his native city of Lebanon, May 21, 1886, at the age of forty years. Mr. Karch had been ill for a long time. He learned the drug business with Jos. L. Lemberger, of Lebanon, and C. W. Hancock, of Philadelphia, attended a full course of lectures at the Philadelphia College of Pharmacy graduated from that institution in 1868, and after filling various clerkships in Ohio, returned to the employ of his former preceptor in Lebanon, and in 1874 went into business for himself, building up a lucrative trade. He was identified with various interests in his native place, and at the time of his death was a member of the Lebanon School Board, and was highly respected as a citizen and Christian gentleman. He united himself with our Association in 1876, at Philadelphia.

John G. Campbell, of Corsicana, Texas, died there after a protracted illness in 1885.

Deceased was considered a competent and reliable pharmacist, and had the reputation of being exceedingly particular as to the quality of medicines he dispensed. Mr. Campbell was elected a member of our Association in 1878, at the meeting held in Indianapolis.

Stephen Webster, of Boston, was born March 28, 1815. When fifteen years of age, he went to Saco, Maine, to learn the printer's trade at the "Maine Democrat Office," and in 1838 he started a Whig newspaper in Saco, called the "York County Herald," which he continued till 1843, when he sold out on account of failing health, and began the study of medicine, for which he had a taste, with Dr. Churchill, also of Saco, Maine. In 1845 he went to Providence, R. I., where he practiced medicine with success till 1870, when he went to Boston and opened a drug store at 63 Warren Avenue, with his son, Geo. C. Webster, who had learned his trade with H. H. Burrington, Providence, R. I. He had been in failing health for nearly five years, but his last sickness was pneumonia, from which he died January 18, 1886, aged seventy years, nine months and twenty-one days. His remains were interred at Biddeford, Maine. Deceased joined our Association at Boston, in 1875.

Stephen F. Penrose died at his residence in Quakertown, Pa., May 6, 1886, of consumption, aged thirty-seven years. He was born near Quakertown, December 15, 1848, received his early education at the public schools and Millersville Normal School, served an apprenticeship to the drug and apothecary business with J. B. Green, M. D., of Quakertown, went to Philadelphia and entered the Philadelphia College of Pharmacy, graduating in the class of 1869. After graduating he entered the drug store of B. L. Smedley, of Philadelphia, and while there had an attack of hemorrhage of the lungs; but he rallied, returned to Quakertown and went into business for himself, which store he still held at the time of his death; owing to his pleasant and courteous manners he made many firm and true friends. He became a member of our Association in 1871, at St. Louis.

Jacob U. Burdge, of New York, was born in Middletown Mammouth Co., N. J., May 10, 1837, and died in New York City on June 8th, 1886, of œdema of the lungs. He began the study of pharmacy in New York City at the early age of fifteen, was first employed by Dr. Smith, at 9th avenue and 22d street, and afterward purchased the store, which he sold in a few years. He then went with A. M. Conklin, where he remained until his last place of business, 482 7th avenue, was purchased in 1874. He was a member of the New York College of Pharmacy, the National Retail Druggists' Association and took an active part in the work done by the late New York Druggists' Union. His many pleasant ways endeared him to all who came in contact with him, and he was a man of strict integrity. Mr. Burdge became a member of our Association in the year 1876, at Philadelphia.

James J. Benedict, of Cleveland, was born at Cooperstown, Otsego Co., N. Y., August 28th, 1884. At the age of nine years he moved to Cleveland, O., where he was educated; at 18 he entered the drug store of N. C. Brewer, with whom he became associated as a partner in 1865. After Mr. Brewer sold his interest, the business was transacted under style of Benedict and Shay until 1874, when Mr. Benedict purchased Mr. Shay's interest. In April, 1880, he removed to the corner of Pearl and Church streets, and in 1884, his health failing, he associated with him as partner Thos. V. Sords, who had been in his employ a number of years. He died Saturday, August 2, 1884, leaving a wife and four children to mourn his loss. Having been closely attentive to business, he was very successful. He became a member of the Ohio State Pharmaceutical in 1880, and of our Association in 1882, at Niagara Falls.

Grenville M. Baker, of Brooklyn, N. Y., was born in Bristol, Maine, in 1834. He retired from business in Brooklyn in the spring of 1886, and returned to his native state,

where he died in May, this year, from being thrown from a carriage. Over 20 years ago he studied medicine and graduated with high honors. He was in business as a pharmacist more than 20 years in Brooklyn, where he was very highly respected by all who knew him as a very conscientious and intelligent apothecary. In connection with the Kings County Pharmaceutical Society and with the Board of Pharmacy, over which he presided for five years, his services were of great value, though given at great cost to himself in consequence of his failing health. He never spared himself when working for the interests of his profession. Deceased became a member of the Association in 1880, at Saratoga Springs.

Henry Sweet, of Chicago, Ill., was born in the city of Brooklyn, N. Y., in 1835, and died in the city of Chicago, in 1886, at the age of 51 years. Mr. Sweet entered the drug business in early life in the city of New York, remaining until 1857, when he came to Chicago, and went into business with his brother-in-law, Wm. Jauncey, the firm being Sweet & Jauncey, located on South Canal street, near 12th street. Some time after, the firm dissolved, Mr. Jauncey remaining at the old stand, and Mr. Sweet locating on the corner of Kinzie and Desplain streets, where he remained in business up to the time of his death. Mr. Sweet was one of the original members of the Chicago College of Pharmacy, at one time its secretary, and for many years a member of the Board of Trustees, taking the greatest interest in its welfare and prosperity. In social life Mr. Sweet was of a very generous disposition, always ready to aid and take part in doing good to his fellow-men, and many of his clerks thank him for their start in business. Mr. Sweet was elected to the position of Alderman by his fellow-citizens, and gave the same satisfaction in this public position that he always gave in private life. He amassed quite a competency, which he left to his three daughters and two sons, his wife having died a year prior to his demise. The elder of his sons is continuing the drug business under the same name. Mr. Sweet became a member of our Association in 1865, at Boston, and frequently attended our meetings.

Charles Faust, of Cincinnati, Ohio, was born in Frankfort-on-the-Main, Germany, August 24, 1845; he was educated in his native city, and there entered a pharmacy as an apprentice. He came to this country when but eighteen years old. After remaining in New York City a short time, he came to Cincinnati, where he entered the employ of Mr. Augustus Hottendorf, and afterward associated himself with Mr. W. S. Hasbruck and Mr. C. H. Muller. In 1870 he established himself in business, and by his industry and popularity soon acquired the good will and confidence of the community. He long held the position of Trustee of the Cincinnati College of Pharmacy, and for years had been its Treasurer. He was married in 1877, and his wife and three children survive him. His death took place January 30, 1886. He was a man of fine business qualifications, honest, upright, courteous and affable to all, and will be sadly missed in the business and social circle of friends. He became a member of the Ohio State Pharmaceutical Association while it was in its infancy, in 1879, and the same year joined our Association at Indianapolis.

John B. Ruble, of Canton, Ill., died at his residence of consumption, aged 34 years, on Sunday, July 4th, 1886. Deceased was born in Canton, in 1852. He began an apprenticeship to the drug business with P. C. Ross, in his native city, and remained with Mr. Ross as clerk till two or three years ago when he became a partner under the style of Ross & Ruble. He was married at Chillicothe, Ohio, in 1881, to Miss Minnie Campbell, who survives him. Mr. Ruble was one of nature's noblemen, ever ready to bestow the hand of charity and assist the needy. His ministrations were unostentatious and not paraded for the plaudits of men. Mr. Ruble became a member of our Association at the Milwaukee meeting in 1884.

Chas. A. Merrill, of Exeter, N. H., died in his native city, Monday, August 9th, 1886,

of consumption. Mr. Merrill was born in Exeter, February 12th, 1822, in the house in which he died, and was sixty-four years old at the time of his death. He was educated in the common schools, and after serving a regular apprenticeship to the drug business, with his brother, H. R. Merrill, in 1848 a partnership was formed under the firm name of C. A. & H. R. Merrill. In 1853 Henry retired from business, and deceased became sole proprietor of the business, which had grown to great and steadily increasing proportions. In 1873 he began the erection of an imposing and elegant structure which bears his name and on its completion established his business in the new block. In fitting up his new quarters he spared neither expense nor labor, and it is stated to be the best appointed drug store in New Hampshire. Mr. Merrill was engrossingly devoted to his business, and took a deep interest in all that concerned his profession. In 1854 he was elected a member of the Massachusetts College of Pharmacy, and in 1874 became a member of the New Hampshire State Pharmaceutical Association. He was a director of the National Granite State Bank from 1879 to 1883, when he was elected President. Deceased was a man of strict integrity, with the kindest feelings for all. He was of a retiring disposition, but his engaging qualities won for him many warm friends. During the funeral exercises all the stores and business places were closed as a mark of respect to the deceased. Mr. Merrill became a life member of our Association in 1882, in accordance with the present By-laws. In 1858 he united himself in membership with our Association at the meeting held in the city of Washington, D. C.

William C. Bakes was an Englishman by birth, but came to this country while quite young, his father dying on the voyage. He was educated in Philadelphia, and became an apprentice at the store of Elias Durand, a highly educated French pharmacist, whose business was located on Chestnut Street, and with the successors, Durand & Fourtelot. After graduating from the Philadelphia College of Pharmacy in 1885, Mr. Bakes was engaged in business for several years on North Seventh Street, and subsequently was Chief Clerk for Prof. Edward Parrish. Later he opened a store on Arch Street, and finally located at Ocean Grove, N. J., where, at the age of 52 years, he died of consumption, August 20, leaving a mourning widow and two sons. For about nine years, Mr. Bakes was a member of the Pharmaceutical Examining Board appointed by the Mayor, and this appointment was not revoked after he located his business in Ocean Grove, until in 1884 an entirely new Board was appointed. He was also active in the organizing of the Alumni Association, was its first President 1864-1865, and always a zealous promoter of its objects. For many years he was a member of the Board of Trustees of the College, and for sixteen years its Secretary. A conscientious pharmacist, one of the neatest manipulators, a faithful officer, and a warm hearted friend—that is the record he left.

Asher C. Nagle died at the home of his parents in Hecktown, Pa., on June 18th 1886, at the age of 28 years. In 1879, he matriculated in the Philadelphia College of Pharmacy, and graduated from that institution in 1881. Afterward he went west, and was engaged in business for several years in Youngstown, O.

REPORT OF THE COMMITTEE ON PUBLICATION.

The Committee respectfully report that with few exceptions the manuscript for the last volume was in the Secretary's hands near the close of October, and about two weeks afterwards the various cuts used for illustration. Only a limited number of cuts had to be specially made; for the loan of the others the Association is indebted to the publishers of the "American Druggist," the "American Journal of Pharmacy," the "Pharmaceutical Record," the "Druggists' Circular," and to Prof. Lloyd. 1700 copies were printed, and the volume was mailed or sent by express in April of the present year.

The cost of publication was as follows :

Report on Drug market, printing and postage.		\$35 30
Proceedings, phonographic report	\$125 00	
Composition, paper, and press-work	1297 59	
Phototype	60 00	
Binding and wrapping	320 00	
		1802 59
Journals for use of Reporter for 1885	\$29 75	
1886	12 38	
		42 13
Other expenses of the Secretary, wood cuts and electrotypes . . .	\$28 70	
Circulars	23 75	
Telegram	40	
Trunk	11 00	
Packing-boxes	3 90	
Freight and expressage	63 85	
Postage stamps	133 55	
		265 15
Salaries of Reporter and Secretary		1500 00
		\$3645 17

The stock of Proceedings on hand and stored at the Philadelphia College of Pharmacy is as follows:

1851.	300 in paper.	1870.	107 in paper.	91 bound.
1852.	80 "	1871.	94 "	56 "
1853.	81 "	1872.	96 "	1 "
1854.	53 "	1873.	14 "	97 "
1855.	95 "	1874.	130 "	21 "
1857.	246 " 15 bound.	1875.	65 "	42 "
1858.	53 " 3 " 130 loose.	1876.	42 "	48 "
1859.	— " 35 "	1877.	48 "	77 "
1860.	— " 195 "	1878.	60 "	108 "
1862.	— " 273 "	1879.	22 "	93 "
1863.	— " 265 "	1880.	82 "	44 "
1864.	178 " 111 "	1881.	52 "	33 "
1865.	151 " 20 "	1882.	60 "	66 "
1866.	67 " 75 "	1883.	44 "	114 "
1867.	150 " 80 "	1884.	56 "	202 "
1868.	54 " 149 "	1885.	115 "	259 "
1869.	97 " 141 "			

That a large number of Proceedings of the last three years remain on hand is due to the fact that many members have been reported by the Treasurer as being in arrears with their dues. Attention is also directed to the reduction of the price of back volumes as announced on page 22 of the printed Proceedings, and it is to be hoped that this will induce many members to complete their set of these publications.

The insurance on the above and other books remains the same as for a series of years past, it being \$2500, in the German Fire Insurance Company of Philadelphia, at a premium of \$15.

JOSEPH P. REMINGTON,
WM. SAUNDERS,
HENRY J. MENNINGER,
JOHN M. MAISCH.

REPORT OF THE COMMITTEE ON CENTENNIAL FUND.

Your Committee respectfully report that in compliance with the provisions of Chapter VII. Article 1st of the By-laws of the Council, they gave due notice through the Pharmaceutical Journals of the nature and object of the Centennial Fund.

That thus far no applications have been made to your Committee for benefit of said fund.

JOSEPH W. ROBERTS,
S. A. D. SHEPPARD,
JOHN M. MAISCH.

REPORT OF THE COMMITTEE ON FINANCE.

The Committee on Finance respectfully present the following report :

The condition of our Treasury varies but little from its condition a year ago.

The cash balance a year ago was \$4278.79; this year it is \$4501.09, a slight increase.

The value of the invested funds a year ago was \$3518.38; this year it is \$3765.94.

This also shows a slight increase.

There is due to the Association a very large amount in annual dues, this amount being, July 1st, as per Treasurer's statement, \$10,105.00, a sum larger by \$1105.00 than the amount due at the same time a year ago.

The members should pay up more promptly.

There is in the Treasury a larger cash balance than is necessary for the needs of the Association.

The Committee recommend that the sum of \$3000.00 be transferred to the Life Membership Fund. It will be thus bringing to the Association a larger rate of interest than at present, and will be at the call of the Association if needed.

Your Committee call attention to the proposed amendment to the Constitution, Proceedings 1885, page 576, and beg leave to express the hope that said amendment may be adopted at the meeting in Providence.

Signed,

S. A. D. SHEPPARD,
JOS. L. LEMBERGER.

REPORT OF THE COMMITTEES ON PERIODICAL AND ON SEPARATE BUSINESS AND SCIENTIFIC SESSIONS.

PROPOSED AMENDMENTS TO BY-LAWS.

CHAP. VI., *Art. IX.* Omit in second line the word "annual," and substitute the following after "Proceedings:" This publication shall contain the papers read and discussions had at the pharmaceutical meetings, which the Publication Committee may deem worthy of insertion; also the reports of the officers and committees, addresses, papers, discussions, full minutes of the several sittings of the Association at its annual meeting, and a complete synopsis of the minutes of the Council; to be published and distributed to those entitled within thirty days from receiving the documents after the close of each meeting; *provided*, that no paper shall be published in full in these Proceedings, if previously published in a periodical or in pamphlet form. The Report on the Progress of Pharmacy, the Roll of Members, and such other matters as may be deemed of interest to the members, shall in like manner be published and distributed as soon as practicable.

Art. X. The Council shall fix the price at which the Proceedings shall be furnished to non-members, and at which suitable advertisements may be admitted; *provided*, that no advertisement shall be accepted which has not been approved by a majority of the Publication Committee.

CHAP. IX., *Art. II., Sec. 4.* Add at end: With the names of those who have been selected by the delegations of Colleges of Pharmacy and of State Pharmaceutical Asso-

cations to serve on the Nominating Committee; these names should be reported to the Council at least four hours before the first session of the annual meeting.

Sec. 7. Substitute the following: The President shall appoint five members who are not delegates, to act with such delegates as may have been selected according to Sec. 4, as a Committee for the Nomination of Officers for the ensuing year.

Art. III. Add new *Sec. 8:* The President shall appoint a Committee of five members to report on the time and place for holding the next annual meeting.

Sec. 9. Incidental business may be called up.

Art. IV. Substitute the following: At the subsequent sessions the order of business shall be as follows:

Sec. 1. Reading of the minutes of the preceding session.

Sec. 2. Reading of the minutes of the Council, and presentation of names recommended for membership.

Sec. 3. Reading and discussion of papers presented by the Committee on Papers and Queries; and until all papers in the hands of this Committee have been read or disposed of, no other business shall be in order at the third and fourth sessions.

Sec. 4. Reports of Committees shall be read and considered.

Sec. 5. Deferred business shall be called up.

Sec. 6. New business.

Art. V. Sec. 1. At each annual meeting the Council shall select for approval by the Association at least three cities in different sections of the country with the view of holding not less than three pharmaceutical meetings during the following nine months.

Sec. 2. The Council shall appoint the presiding officers and clerks of these pharmaceutical meetings.

Sec. 3. The order of business at the pharmaceutical meetings shall be as follows:

1. Nine members shall constitute a quorum.

2. Papers on subjects relating to pharmacy or its collateral branches may be read and discussed.

3. Subjects of scientific or practical interest, or coming within the objects of the Association, may be brought forward and discussed, and if deemed of sufficient importance, may be referred for final action to the annual meeting; but no resolution binding the Association shall be entertained.

Sec. 4. The papers and discussions shall be promptly forwarded to the Permanent Secretary for publication, as provided for in Chap. 7, Art. IX. of these By-laws.

REPORT OF THE COMMITTEE ON REDUCING EXPENSES.

Your Committee appointed to consider and report upon a plan for reducing the expenses of the Association, respectfully offer the following:

We find the principal items of expense to be

1st. The cost of Proceedings and issuing the same to the members.

2d. The salaries of the officers, their office and traveling expenses.

3d. The traveling expenses of members of Council, when special meetings of Council occur between the annual meetings of the Association.

The *first item*, that of printing and issuing the Proceedings, seems to have been done by the best possible plan, that of awarding to the lowest bidder the printing and binding of the Proceedings, and on this item we have only the following to offer, viz.: As the Committee on Publication have under consideration the propriety of changing the mode of issuing the Proceedings from an annual to a periodical publication, a large saving of expense may result, mainly in the binding and mailing.

As to the second item, we believe with some modification, that none of the officers are overpaid, and it would not be advisable to curtail in this direction, as "the laborer

is worthy of his hire," and we believe that the permanent Secretary, the Treasurer, Reporter on the Progress of Pharmacy, and the Secretary of Council, fully earn the salaries severally paid them. Your Committee believe, however, that the Permanent Secretary with the help of a clerk employed, as needed, could perform the duties of Chairman of Committee on Membership in the interim, at a less cost to the Association, as this officer's duties at the annual meeting are comparatively light.

Item 3. It has been demonstrated during the past year, that the most urgent business brought before Council can be transacted measurably well by correspondence, and an amount of over a hundred dollars is also saved.

Your Committee offer the following conclusions:

1st. The greatest item of expense being the cost of printing, binding, and issuing the Proceedings, the Association, if it pleases, can change the plan according to recommendation that will be offered by the Committee on Publication, thereby in all probability saving between four and five hundred dollars.

2d. Save in the case of the Chairman on Committee on Membership's Salary, it is not advisable to curtail.

3. If the ad-interim meetings of the Council are discontinued, the item of attending necessary expenses will also be saved, so that as a whole, there is a possibility of a considerable reduction of the running expenses of this Association.

Respectfully submitted,

JOS. L. LEMBERGER,

JOSEPH ROBERTS,

G. W. KENNEDY,

Committee.

The Treasurer now read his annual report, as follows:

TO THE OFFICERS AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

Gentlemen: It is expected that the Treasurer will, at this time, give an account of his stewardship for the past year.

All the bills presented to me previous to the 1st of July have been paid, and there was a balance on deposit at that date of \$4,501.09. This does not include the invested funds of the Association, amounting to \$3,765.94. I have paid one bill since, amounting to \$111.47, and have received and deposited since that date \$2,145, so that at this time we have on deposit \$6,544.62. There is a large amount due the Association from unpaid fees, which, with diligent exertion by the Treasurer, can be much reduced before the Proceedings are published. A long list of members are liable to be dropped from the roll, which can be much curtailed before the Proceedings are in the hands of the printer.

We regret that a smaller number of members have been added to the Association for the last two, than in former years. I can hardly account for the diminution, unless the members have made less exertion to add to our ranks. We are glad to notice the prosperity of the State Associations, and that many have been organized, but we hope the interest bestowed upon them will not lessen that given to our parent Association. If our members generally would use their influence to increase our membership, we should add many more than we do at each annual meeting. The Treasurer will not ask more of others than he will do himself, since two hundred and twenty letters on this subject have been sent by him since the beginning of the year.

The subject of reducing the dues and admitting members without charge for membership, has been brought to the notice of the Association. I do not deem it expedient at present. The incomes from the Ebert and Centennial funds are for specific purposes. As I understand it, the income from the Life Membership Fund can be used for general expenses. I have thought it would be well to make extra effort to gain more life members, and to increase that fund to twenty or twenty five thousand dollars, and then re-

duce the dues or membership in proportion to the amount received from that fund. We have now on deposit over six thousand dollars. We have received for it two per cent. interest, and have been notified this week that one half per cent. more will be paid in future. Four thousand dollars could be withdrawn and added to the Life Membership Fund. This might be so invested that the Association would receive more interest. Each year such sums might be withdrawn as were deemed best, and added to the same fund.

Your Secretary and Treasurer were Vice-Presidents of the Association the same year, and have held their respective offices twenty-one years. I feel grateful to the kind Providence that has, it seems to me, so signally ordered it that neither of us has been prevented, by sickness or accident, from being present at all the sessions of all these meetings. I find that I have been present at twenty-seven of the thirty-four meetings of the Association. I have had a personal acquaintance, with perhaps three exceptions, with every member who has held office since its formation. Many have been intimate friends—I think of Procter, Parrish, Chapman, Smith, Meakim, Milliau, Carney, Wayne, Guthrie, Bringhurst, Ellis, Hollis, Massot, Kiersted, and Parsons.

My recollection of these members is peculiarly pleasant, and I feel glad that I was so fortunate to know these stalwart knights of Pharmacy and pillars in our Association, who have done much to make American pharmacy respected at home and abroad.

As your Treasurer has always been actively engaged in business, and every moment of his time in demand, errors have occurred, and always will occur with so many accounts. He has always gladly corrected them as soon as he has known them, and he trusts they may be ever attributed to the head and not to the heart.

The increasing work of the Association, in addition to my own business, I have long been aware is too much for me, if I wish to keep my health, and I have decided to decline another election as your Treasurer.

Thanking the members for the pleasant intercourse of the past year, and with the best wishes for all, I close my twenty-first report.*

Signed,

CHARLES A. TUFTS, *Treasurer.*

The Association then adjourned till Wednesday morning at 9 o'clock.

SECOND SESSION.—WEDNESDAY MORNING, SEPTEMBER 8.

President Roberts called the meeting to order. The minutes of the first session were read by the Secretary, and on motion were approved.

Mr. Kennedy read the minutes of the eighth session of Council, which were likewise approved. The following business was transacted:

SESSION SEPTEMBER 7. (8 members present.)

The applications of three candidates for membership were examined and referred to the Association. The following candidates previously reported were duly elected:

Albert S. Dolloff, Lake Village, N. H.

Benj. F. Downing, Newport, R. I.

August Drescher, Newark, N. J.

George E. Dresser, Putnam, Conn.

Henry A. Estabrook, Fitchburg, Mass.

Charles T. P. Fennel, Cincinnati, O.

Fred. Wm. Fink, New York, N. Y.

Willis G. Gregory, Buffalo, N. Y.

B. Frank Hays, New York, N. Y.

Arthur B. Howson, Chillicothe, O.

*At the time of going to press, the statements accompanying this report were still in the hands of the Examining Committee.—EDITOR.

Cornelius Jos. McCarthy, Shenandoah, Schuylkill co., Pa.	Cornelius W. Stryker, Philadelphia, Pa.
Clark Z. Otis, Binghamton, N. Y.	Azor Thurston, Grand Rapids, Wood co., O.
Benj. F. Quackinbush, New York, N. Y.	William E. Warn, Keyport, N. J.
Henry Schmid, New York, N. Y.	J. Le Roy Webber, Detroit, Mich.
	Edward E. Wright, New Bedford, Mass.

The credentials from the Maryland Pharmaceutical Association and from the Literary and Scientific Society of German Apothecaries of New York were received, and the gentlemen accredited were admitted as delegates.

The report of the Nominating Committee was presented and read as follows:

REPORT OF NOMINATING COMMITTEE.

PROVIDENCE, *Sept. 8, 1886.*

MR. PRESIDENT AND GENTLEMEN:

Answering the call of the Chairman, Mr. Charles A. Tufts, the Nominating Committee met, the result of their deliberations being as follows:

President—Charles A. Tufts, Dover, N. H.

1st Vice-President—Henry J. Menninger, Brooklyn.

2d Vice-President—M. W. Alexander, St. Louis.

3d Vice-President—Norman A. Kuhn, Omaha.

Treasurer—Samuel A. D. Sheppard, Boston.

Secretary—John M. Maisch, Philadelphia.

Reporter on Progress of Pharmacy—C. Lewis Diehl, Louisville.

Members of Council—George W. Kennedy, Pottsville; Albert H. Hollister, Madison; P. C. Candidus, Mobile; Wm. H. Rogers, Middletown, N. Y., in place of unexpired term of Sheppard.

Committee on Drug Market—Geo. J. Seabury (Chairman), New York; Mahlon N. Kline, Philadelphia; E. Waldo Cutler, Boston; Daniel Myers, Cleveland; C. F. G. Meyer, St. Louis.

Committee on Papers and Queries—Virgil Coblentz (Chairman), Springfield, O.; Wm. W. Bartlet, Boston; E. Painter, New York.

Committee on Prize Essays—C. Lewis Diehl (Chairman), Louisville; Emil Scheffer, Louisville; Rosa Upson, Marshalltown, Ia.

Committee on Legislation—T. L. A. Greve, Cincinnati; John M. Maisch, Philadelphia; Edmund Bocking, Wheeling.

Respectfully submitted,

ROSA UPSON, *Secretary.*

CHARLES A. TUFTS, *Chairman.*

On motion of Mr. Ebert, the report was accepted, and on motion of Mr. Remington, a ballot was ordered to be taken for the entire ticket. The chair appointed Messrs. Bocking, of Wheeling, and Nicot, of Brooklyn, tellers, who subsequently reported the unanimous election of all the nominees.

Mr. Seabury, on entering the room, stated that he had just learned that he had been elected chairman of a committee, and that it would be impossible for him to serve on any committee or in any office, though he would gladly serve the Association in other ways.

On motion of Mr. Colcord, Mr. Seabury was relieved from being

Chairman of the Committee on the Drug Market. Mr. Main was nominated, but declined to serve, and the vacancy was then referred back to the Nominating Committee for report.

Messrs. Ebert of Chicago, and Hays, of New York, were appointed by the chair a committee to conduct the newly-elected officers to their places. President Roberts introduced the President for the ensuing year, the Association rising.

PRESIDENT ROBERTS—I introduce to you your new President, Charles A. Tufts. You know him well. He will speak for himself.

PRESIDENT-ELECT TUFTS.—*Gentlemen of the Association:* In electing me to this honorable position as your President, allow me to express to you my grateful thanks. I am more grateful as it is unexpected and unsolicited. In the large Nominating Committee which met last night, composed of representative men of the different Associations which are assembled at this meeting, among them five ex-Presidents, my name was the only one presented, and I was unanimously nominated. My wish was to decline, as I had on previous occasions; but the expression of my friends was so pronounced, that against my better judgment I accepted the nomination. In the long list of Presidents who have occupied this position, are the names of some of the most eminent pharmacists of this generation, who have discharged the duties of the office with eminent ability. With diffidence and with hesitation, I follow in the footsteps of those distinguished men; with whatever ability I may possess, and with whatever experience I may have obtained in presiding over small bodies, I shall gladly give it, that I may execute the duties of this office in such a manner as may meet your approbation. My friends, I again thank you for this honor. (Applause.)

The First Vice-President, Dr. Menninger, was then introduced and said:

MR. MENNINGER.—Mr. President and gentlemen, I thank you for the honor you have conferred upon me, and I shall endeavor in my humble way, as I have done for the last twelve years, to serve the Association as a member, and in various other capacities. I feel, with a good parliamentarian in the chair, there is very little that I can do as Vice-President; but I thank you for the high honor conferred.

The Secretary read the following telegram:

“SAN FRANCISCO, Sept. 7, 1886.

“TO THE AMERICAN PHARMACEUTICAL ASSOCIATION:

“Greeting from the California Pharmaceutical Society and College. Best wishes for successful meeting. Come to California next time.” Signed by the Trustees.

On motion of the Secretary, this telegram was referred to a committee of three to be appointed by the chair, on the time and place of next annual meeting.

Mr. Sheppard gave notice of an amendment to the By-laws.

MR. SHEPPARD.—Mr. President and Gentlemen of this Association, you have done me the honor to select me as Treasurer of this Association. I will accept the position on one condition, and that is that the salary be lowered. I don't think the Association

ought to pay the Treasurer more than \$600 a year, and I give notice to amend the By-laws—Art. IV., Chap. IV.—by inserting the figures \$600 in the place of \$750.

President Tufts requested Mr. Sheppard to be conducted to the platform, but the latter declined.

THE PRESIDENT.—I take pleasure in introducing to you my old friend S. A. D. Sheppard, whom you have elected Treasurer. Gentlemen, for twenty odd years I have been associated with him, and with my old friend, John M. Maisch, whom I want to introduce as your Permanent Secretary, and to give my tribute to the man for whom I have the warmest and heartiest feelings.

JOHN M. MAISCH.—It has not been customary heretofore for the Secretary to be introduced in this manner, and I am rather taken by surprise by my friend Mr. Tufts; but can assure you that as long as you see fit to elect me Secretary, and as long as I am capable of performing the duties, not only those of Secretary, for the Association, you will always find me ready to do so to the best of my ability. I thank you sincerely.

The Secretary read the report of the Committee on Legislation (see page 10), and Mr. Colcord moved that the report be accepted and adopted.

MR. MAIN.—Mr. President, the first portion in regard to the proposed action on proprietary medicines, it seems to me, requires a little more thought before it is carried. On reading the report, as printed last year, while some things may be very good, it seems to me that if such laws were passed, all proprietary medicines would be worthless; that is it the proposed law makes, a misdemeanor to sell them in their present condition. I do not think that the Association wants to agitate that question.

MR. ROBERTS.—I ask for the reading of the special clause. I do not understand that such an enactment would apply to any goods already in stock. It would be a retroactive law, if that was the case, and that cannot be.

MR. HALLBERG.—How are you going to distinguish between what goods are in stock and what are not? It is impossible to distinguish between them.

MR. ROBERTS.—We have nothing to do with that at all.

MR. MACMAHAN.—We do not want to go on record as doing anything for the patent medicine people, by trying to pass laws in different states. It don't look reasonable.

MR. EBERT.—If I understand this report, it is made by our Committee on Legislation to advise us what laws have been enacted. We have nothing to do with regard to adopting laws. We receive the report the same as we receive any other. What, for instance, King's county wants to do, or what it has done, is no business of ours as an Association. This report brings the enacted laws before us; we receive it, and that is all we do.

THE SECRETARY.—Mr. President, it has been customary heretofore to accept such reports, and if a resolution was appended to it, that resolution was taken up afterwards and considered or laid upon the table. That is all. The resolution proposed in the beginning of this report does not express any opinion as to the exact way and the absolute efficiency of that draft of a law submitted last year, but it simply says that this is one of the means of reaching certain ends.

The preamble and resolution printed on page 10 were again read.

MR. MACMAHAN.—I move to strike out that part of it that has reference to the officers of the Association. It would be ridiculous to send any such resolution as that to the different Legislatures. The first question that would be asked would be, What is there in it? We have no money for such a purpose, and we do not want to go on record as asking for any such thing as that.

MR. EBERT.—I second the motion that it be stricken out.

THE SECRETARY.—Do I understand that the motion is to strike out the latter part of the resolution?

MR. MACMAHAN.—I mean the whole of the resolution; that will relieve the officers of that trouble.

THE SECRETARY.—You mean then the preamble and the resolution?

MR. MACMAHAN.—Yes, sir; all relating to patent medicines.

THE SECRETARY.—The first is only a preamble, and there is only one resolution.

MR. MACMAHAN.—My motion is to strike out the whole. There is no use, we do not want to spend money printing any such thing as that.

MR. HALLBERG.—I object to having that struck out. I think that this Association can well afford to place itself on record against the patent medicine industry, and though the benefits to be derived are exceedingly deceptive in some way, I say legislate on this subject. We are supposed to be representatives of pharmacists of this country, and it is supposed that this Association is in a position which makes it a better judge on such a subject than any other class of people in this country. No one can properly characterize this great evil, which is an evil not alone to the community at large, but a much greater one to the interests, professional as well as commercial, of the retail druggists throughout the United States. I for one would urge that the officers should go to any reasonable expense that is necessary for printing, and do everything to post the legislatures of this country on the patent medicine question, so as to get something done to rid us of the onerous and nefarious traffic.

MR. DAY.—I understand the spirit of this Association to be against the patent medicine evil. As Chairman of the Committee of Legislation of the State of Illinois, I am charged or will be charged this winter with the duty of presenting among other amendments to our Pharmacy Law, one touching upon this very subject, and I shall be glad to have our legislature in Illinois understand that I have the moral support, at least, of an Association like this. Therefore I hope that this resolution will not be stricken out.

MR. REMINGTON.—I thoroughly agree with the remarks of Mr. Hallberg and Mr. Day. I think this Association has a legitimate object to fulfill against the patent medicine interest, and whilst I admit that the chances of doing a very great deal are slim indeed, still it will give the moral support to the State Associations, and our legislators throughout the country should know that the American Pharmaceutical Association has put itself on record. For that reason I will cheerfully vote for the resolution.

MR. DAY.—I would like to say one word more, with the permission of the Association. That part of the resolution which recites that the officers of the Association shall place themselves in communication with the governors and legislatures, I don't care for, if it will be an item of much expense. I am satisfied the information will go to the leg-

islatures and to the governors of the States without the officers taking the trouble to communicate with them, and without incurring any expense. It is the gist of the resolution that I would like to see prevail.

MR. MAIN.—There is no necessity for this Association taking the action which some of the gentlemen think to be necessary. Probably not one member in ten is thoroughly conversant with the proposed act of last year, and I think that matter had better be laid over until the members of the Association can acquaint themselves with the provisions and with what they are advocating. I don't think it is for this Association to take such action with regard to proprietary medicines.

MR. COLCORD.—This discussion reminds me a good deal of the man in our State who was enthusiastic for prohibition, but was against its enforcement. That is the way with us, we set down on patent medicines and talk against them, and yet we still sell them. If a customer comes to buy them, then we are glad to supply him with all he wants, even if we sell a dollar article at 67 cents. I don't know what benefit is going to be gained on one side or the other.

MR. SAYRE.—I move that the report be laid on the table till we have a larger attendance.

MR. REMINGTON.—The probability is that we will never have a fuller attendance than we have got now. We have been talking now for a long time on this subject, and as we have a good many papers to read, I would urge that the question be settled here and now, and that the resolutions and the report come before us for action.

After some further discussion as to the question before the house, a vote was taken on Mr. Macmahan's amendment to strike out the resolution, and a division being called for, it resulted in 20 ayes and 47 nays; so the motion to strike out was lost.

Mr. Sayre renewed his motion to lay on the table till a future session, which was not agreed to.

Mr. Colcord's motion to accept and adopt was modified to merely accept the report on legislation, which was thus carried.

Mr. Diehl moved, seconded by Mr. Hallberg, that the preamble and resolution be adopted.

The motion was carried.

The Second and Third Vice-Presidents were introduced to the meeting by President Tufts.

MR. ALEXANDER.—Mr. President and members of the Association: It is with a good deal of hesitation that I rise in so distinguished a body to accept the position of the Second Vice-President. When I look upon the young and active form of our worthy President, and when the stalwart form of the First Vice-President looms up before me in the first position, I do not feel that I will be called upon to exercise any particular function in the position of Second Vice-President; but gentlemen, I am very grateful to you, and offer you my hearty thanks for the distinguished honor which you have conferred upon me.

MR. KUHN.—Mr. President and members of the American Pharmaceutical Association: It was with a backward feeling that I came forward to thank you for the honor

that you have conferred upon me. When I came into this Hall all the officers had been installed, and I thought I had escaped this infliction and would be passed by. As a member from the far West I thank you for this honor, and I take it that it is intended but as recognizing that portion of our country where cyclones and corn are the chief fruits receiving attention, and as our worthy Second Vice-President has said, I feel that with the officers before me, I will not be called upon to perform the duties of the office. I thank you, however, for the honor.

Mr. Roberts moved that the Committee on the time and place of the next meeting be now appointed. The motion was carried, and the President appointed Messrs. Lloyd of Cincinnati, Painter and Bedford, of New York. Mr. Lloyd desiring to be excused, Mr. Wells was appointed in his place.

The Secretary read the following report of the Committee on the best time for the annual meetings :

TO THE OFFICERS AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Your Committee to whom was referred the task of ascertaining the wishes of the membership as to the time of annual meeting, would respectfully offer the following report :

In the month of May a circular was mailed to each member's address as given in the last volume of Proceedings; enclosed was a postal card with the calendar months printed thereon, and a request to indicate which one was the individual choice.

The following is the result :

January, 1; February, 9; March, 3; April, 10; May, 37; June, 65; July, 29; August, 145; September, 345; October, 118; November, 15; December, 4.

Sixteen were returned by the Postal Department as not found, some few were reported as dead, and a large number paid no attention to the request.

Your Committee, however, received many suggestions from members who have been faithful in their devotion to the Association, and from these suggestions he would conclude that it is not the *time* of the year that has made the attendance upon our meetings less than we could rightfully expect from our large membership, so much as from other causes, viz: one factor being the expense of time and money necessary, the average pharmacist being unable to spare the means.

Again, quite a number of valued members are not in sympathy with the entertainment methods which within a few years have thrust themselves upon the Association. While it may be foreign to my duties in this case, still, from the correspondence I have received during the summer, I feel that I but reflect the minds of many in suggesting that it would be wise if the Association would drop entirely the subject of entertainments. The subject has proven a great source of annoyance to many, has hurt the feelings of others, and has not apparently added to the attendance.

Very respectfully submitted,

GEO. W. SLOAN.

Indianapolis, August, 1886.

The report was accepted, and the report of the Committee on the Drug Market was then read by Mr. Kline, accepted, and referred for publication (see page 1).

Mr. Macmahan moved that the afternoon session be set apart exclusively for the reading of scientific papers.

MR. DAY.—Has not that question been passed upon last year? Is not the subject regulated by a rule?

THE SECRETARY.—I am sorry so much discussion has been had on this subject. You must remember, according to the By-laws, these cannot be suspended. That was a By-law which was adopted last year, and which reads as follows: "At each subsequent session—that is, after the second—except such as may be held for a specific purpose, after the expiration of one hour from the appointed time of meeting, the report of the Committee on Papers and Queries shall be considered, unless by vote of three fourths of the members present." Mr. Macmahan's motion is, therefore, perfectly in order. Any session may be set apart for the reading of scientific papers.

MR. REMINGTON.—Whilst I fully agree with the motion made by Mr. Macmahan, I would say with reference to Section VI, of Article III, that it prescribes the order of business at the second session in regard to the Standing Committees and Special Committees. I don't think it will be competent for this Association to take up scientific papers until these committees' reports have been considered.

THE SECRETARY.—If I understand Mr. Macmahan's motion, it refers to the next session.

MR. MACMAHAN.—That is correct.

Mr. Macmahan's motion was then adopted.

Mr. Lemberger read the following report of the Committee to visit the National Wholesale Druggists' Association.

TO THE PRESIDENT AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen: Your Committee appointed to visit the National Wholesale Druggists' Association at the meeting in Philadelphia, October 20th to 22d, 1885, would respectfully report having attended to that very agreeable duty. All the members save one, found it convenient to attend; and at their first session your Committee was recognized, and accorded the freedom of the Convention.

The Chairman of the delegation, Charles A. Heinitsh, in presenting the credentials, addressed the Convention in words of fraternal greeting, giving expression of the sense of this Association as to the pleasing relations we hold the one to the other, they the commercial and we the scientific, recognizing in their capacity as a national organization, the embodiment, in the highest sense, of an Association of honorable business men. The address of the Committee was responded to by Mr. Daniel R. Noyes, of St. Paul, Minn., in most cordial words, and we were made to feel that we were not strangers, but rather the elder brothers among the younger family; and welcomed, not only to take a part in their proceedings, but were made participants also of most cordial hospitality, so well and truly bestowed by the loosened purses of the Philadelphia Wholesale Drug Trade.

The National Wholesale Druggists' Association were pleased to recognize the American Pharmaceutical Association as a safe guide for them to follow, "in fairness of dealing and honor among brethren."

The Association was presided over by an esteemed fellow-member of this Association, Mr. Christian F. G. Meyer, of St. Louis, and at the expiration of his term of office the same distinguished honor was awarded to another worthy member, our Mr. Mahlon N. Kline, of Philadelphia.

The deliberations of the National Wholesale Druggists' Association were of a character to favorably impress your Committee, and we are pleased to report that the work to

which that Association is devoted is carried forward with marked ability and intelligence, and the American Pharmaceutical Association has made no mistake in recognizing the National Wholesale Druggists' Association as a worthy corresponding body.

In conclusion we allude to the reception in the beautiful Academy of Fine Arts. The banquet in Horticultural Hall was rarely excelled in "feast of reason and flow of soul." And the excursion up the Delaware River, all most enjoyable, as the social events of the meeting to all of which your representatives were invited with a cordial welcome.

Respectfully submitted,

JAMES T. SHINN,
CHAS. BULLOCK,
CHARLES A. HEINITSH,
JOS. L. LEMBERGER.

Committee.

The report was accepted and referred; and attention was drawn to the fact that credentials had been received accrediting a committee from the National Wholesale Druggists' Association, and that Mr. Main, the Chairman, and other members of that committee, were present. Motions were then made and adopted that the Committee of the National Wholesale Druggists' Association be received, and that a committee be appointed by the Chair to visit that body at its next annual meeting.

MR. MAIN.—Mr. President and Gentlemen: It gives me great pleasure to attend this meeting as the representative of the National Wholesale Drug Association. As you are well aware, between individual members of both Associations there exist certain intimate relations, and there seems to me to be no reason why the relations between the two Associations should not be very fraternal and close, inasmuch as I find in the articles of your Constitution that one of your principal aims is to regulate the drug market, to prevent the importation of poor drugs, and to expose sophistication and adulteration. On these grounds both Associations can join hands. I can assure you, in looking after and in elevating the standard of drugs you will be heartily supported by the members of our Association. I have often wondered, gentlemen, whether the members of this Association realize how the standards of quality in the drug market are regulated by your own demands. If the members of the pharmaceutical profession demand high grades of drugs, the drug market will most certainly respond; if, on the other hand, they demand goods of low quality they will certainly get them; but in all your efforts to obtain a high grade of goods and prevent adulterations, you may be sure our Association will most heartily support you and act hand in hand with you. I will not at this moment, Mr. President, take up any more of the valuable time of this Association, except to say that the delegates you may send to our meetings will always meet with a cordial reception, and the best hospitality we can present.

Subsequently, the President appointed the following committee to visit the National Wholesale Druggists' Association at its next meeting, to be held in Minnesota: Karl Simmon, of St. Paul; Henry Biroth,* of Chicago; Albert H. Hollister, of Madison, Wisconsin; George Huhn, of Minneapolis, and Samuel Boyce, of Duluth.

* Mr. Biroth, being unable to attend the meeting, declined the appointment, and the President appointed Mr. William B. Blanding, of Providence, R. I., in his place.—SECRETARY.

Mr. Diehl read the following report of the Committee on Prize Essays, which was accepted :

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen : Your Committee on Prize Essays have the honor to report that, having carefully reviewed the papers read at the Thirty-third Annual Meeting, they do not consider that any of them are entitled to the Ebert Prize:

Respectfully submitted,

C. LEWIS DIEHL, *Chairman,*

EMIL SCHEFFER,

OSCAR OLDBERG.

August, 1886.

Mr. De Forest read the report of the Committee on National Formulary.

Vice-President Alexander occupied the chair.

REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

MR. PRESIDENT, AND FELLOW-MEMBERS OF THE ASSOCIATION:

After the Association had accepted the offer made at the last meeting by the societies representing the New York and Brooklyn Formulary, to adopt the latter as a nucleus for the preparation of a National Formulary of Unofficial Preparations, it became necessary to appoint a new Committee to carry out the purpose of the resolution. The Association thought fit to re-appoint the previous Committee for another year, thereby implying that it had sufficient confidence in its members to entrust them with the inauguration of this important work. Although the members of this very Committee had, for nearly three years, been constantly engaged upon work connected with the Formulary, and had expended so much time, money, and labor upon experiments, that they considered themselves entitled to a well-earned rest for some time to come, yet they believed themselves under obligation to accept the imposed task for the sake of the object to be attained. Fully aware of the difficulties before them, and conscious that they needed the active assistance and co-operation of others, they have performed their duty, if not to general satisfaction, at least to the best of their ability.

In order to profit by the knowledge and experience of such members of the profession as could personally attend the meetings, one of the first acts of your Committee was to request the same pharmaceutical societies of New York and Brooklyn, which had already previously been carrying on conjoined work, to appoint new committees of five members each, who should sit and act with your Committee until the latter could draw up its final report on the basis of the joint investigations. In this manner, a working Committee of twenty members was established, which greatly facilitated the distribution of the work. Meetings of the Committee were held almost weekly, and during the year many hundred specimens of various compounds, many of them prepared simultaneously by different members, were brought forward, criticised, analyzed, or otherwise examined, and after due deliberation either rejected or adopted.

Much diversity of opinion prevailed in the beginning respecting the scope of the proposed Formulary. After well considering the subject in all its bearings, it was finally agreed that the wisest plan would be to gradually include in the Formulary every preparation legitimately belonging to pharmacy which is in professional or popular demand, and for which the U. S. Ph. prescribes no standard. On the other hand, it was decided that all purely technical, empirical, cosmetic, trivial or noxious articles should be excluded.

Having arrived at this conclusion, your Committee took pains to ascertain the titles of all such preparations as were in common use, and came under the before-mentioned

category, whereupon it set to work to examine the processes for preparing them in the most economical, expeditious, and successful manner. In making the selection of titles, your Committee had, of course, to trust largely to its own local experience. It is quite likely that the list of titles will be considerably increased hereafter, when other sections of the country shall have been canvassed.

Another question which obtruded itself prominently at this time was, whether the formulæ should be constructed in parts by weight, or in definite weights and measures. Inasmuch as it appears to your Committee highly probable that the system of parts by weight adopted in the last revision of the U. S. Ph. will, in the next revision, either be supplemented by the addition of definite weights, or perhaps entirely superseded by the latter, at least in the case of all liquid pharmaceutical preparations (such as tinctures, wines, fluid extracts, etc.) *which are administered by measure*, it was decided to adopt definite weights and measures, even in those preparations which are taken from foreign pharmacopœias, except in a few cases, where there is an obvious advantage in omitting to specify definite weights, and where "parts by weight" are preferable (for instance, in giving the proportions of the constituents of an ointment).

Soon after its organization, the Committee addressed circulars and appeals to the various State and other Associations, asking them to forward their contributions at as early a date as possible. Your Committee has been much gratified in meeting with hearty responses, many of which recorded the fact that the New York and Brooklyn Formulary—which the Committee had given to the Association, and which they made the nucleus of their new work—had found such a large circulation and official recognition in all parts of the country, that many of the correspondents expressed their willingness to abide by the new formulæ that might be brought forward, without embarrassing the Committee with demands for the recognition of substitutes that had perhaps been less well tried. As you are aware, it would be an easy matter for a hundred different committees, scattered over the whole country, to devise each a separate formula for, say Simple or Aromatic Elixir, as well as for a host of other compounds, all of which may be of individual excellence and merit. But should each be adopted as the standard in its own locality, the very object of a "National Formulary" would thereby be rendered nugatory. To produce a national standard, all societies must be prepared to *take* as well as to *give*. Only by throwing aside all sectional tendencies and joining hands, can success be accomplished.

In examining the contributions received from societies or individuals, it was found that the proposed formulæ could be classified as follows:

1. Such which involved merely a slight change—with a view to improvement—in some of the formulæ contained in the N. Y. & B. Formulary. All recommendations tending in this direction were carefully considered, and, in a large majority of cases, adopted, after due experiment.

2. Such which were entirely new additions, and did not conflict, either by general composition or in the character of any one constituent, with any preparation already adopted by the Committee or proposed by others. These formulæ were, of course, unhesitatingly adopted.

3. Such which duplicated other formulæ already passed upon, or proposed by others. In these cases great care and judgment were necessary, and the Committee does not flatter itself that it has always reached the true solution. Some compromise, however, had to be made. For instance, one formula for a certain elixir containing strychnine directed $1\frac{1}{4}$ grain, another (for the same elixir) 2 grains, and still another 3 grains, in one pint. Here it was necessary to establish a definite standard. Accordingly, the Committee decided that in all preparations where strychnine served purely as a bitter tonic, its dose should not exceed $\frac{1}{100}$ grain in a fluidrachm. In other preparations,

however, which are administered for the purpose of producing the characteristic therapeutic effects of strychnine, the quantity was adjusted at $\frac{1}{56}$ grain in the fluidrachm.

There are a few preparations, regarding which the Committee has not, as yet, been able to arrive at a final conclusion, as to which of several offered formulæ are the most acceptable. These are reported side by side, for further scrutiny and discussion, so that finally a single and perfect formula may be agreed upon.

Finally, a considerable number of new preparations have come to the knowledge of your Committee at such a late date that it was impossible to include them in the present report. These will have to be reserved for study during the ensuing year.

The Committee found great difficulty in arranging the several formulæ in proper alphabetical order, because some of them are known by various popular names, and it was difficult to decide which of these should be placed at the front. In order to get rid of this embarrassment, it was decided to choose Latin titles for all the formulæ, under which the several synonyms could be arranged.

Your Committee has the pleasure of reporting the receipt of communications or contributions from the following societies and individuals:

Kansas. The Kansas Pharmaceutical Association at its meeting, June 9th-10th, 1886, adopted the New York and Brooklyn Formulary, as tendered to the American Pharmaceutical Association, as the best basis then to be found for a National Formulary. A Committee consisting of Messrs. W. C. Scott, Leavenworth; R. H. T. Nesbitt, Leavenworth; and Frank Frisby, Atchison, has corresponded with your Committee, and is engaged in elaborating certain contributions.

Kentucky. The Secretary of the Kentucky Pharmaceutical Association forwarded, by direction of the Association, a number of copies of the report of the Committee on Private Formulas by Prof. C. Lewis Diehl. The latter had, already before, favored the Committee with a copy of his report and with offers of assistance.

District of Columbia. Messrs. W. S. Thompson and R. B. Ferguson, on behalf of the National College of Pharmacy and their Joint Committee, forwarded a revised copy of their Formulary, with numerous improvements and additions.

Michigan. The members of the Committee appointed by the Michigan Pharmaceutical Association were: Dr. A. B. Prescott, Ann Arbor; and Messrs. A. B. Lyons, Detroit; O. Eberbach, Ann Arbor; F. G. Wurzburg, Grand Rapids; Frank Inglis, Detroit. Prof. Prescott has forwarded what had been contributed to their Committee.

Illinois. The Committee of the Illinois Pharmaceutical Association, consisting of Messrs. C. S. Hallberg, Andrew Scherer, John Conrad, Rudolph E. Rhode, H. W. C. Martin, all of Chicago, has furnished advance sheets of a valuable report presented at their last meeting, in which many excellent amendments to the New York and Brooklyn Formulary were offered. In addition, the Committee forwarded a set of formulas which had been already reported on at one of their previous meetings.

Wisconsin. Prof. Fred. B. Power has forwarded the report of the committee of the State Association, the other members being Messrs. C. H. Bernhard, H. C. Schranck and H. T. Eberle. This report contains, among others, a list of titles of preparations recommended to be included in the Formulary.

Pennsylvania. The Pennsylvania Pharmaceutical Association at its meeting held June 8th to 10th, 1886, instructed its Secretary to forward the Report presented by the Chairman of its Formulary Committee, to the Committee on National Formulary of this Association. This report did not reach your Committee, however, until August 23d, the Secretary reporting that the manuscript had been outside of his control ever since the meeting. It was therefore impossible for your Committee to give it the attention which it ought to receive.

Missouri. A contribution was received from Prof. J. M. Good, of St. Louis, as one of the members of the Formulary Committee of the State Association.

Various other State Associations have also appointed Committees, with instructions to put themselves in communication with your Committee, and to contribute toward the success of the National Formulary.

It was at first hoped by your Committee that the contributions of the different Societies would arrive so promptly that a well-digested and complete draft of a National Formulary could be presented for your action and eventual approval. This might, perhaps, have been done by jointing and dovetailing together all the transmitted formulas as nearly as it could be done, into one consecutive series, in which case it would have been necessary to prune and trim many of them, or to graft one upon another so as to make them harmonize. Your Committee, however, have deemed it unwise to proceed in this manner, which would certainly jeopardize the whole undertaking. It would, moreover, have been highly presumptuous in them to attempt to decide alone on the merits of compounds which are used in other sections of the country, or even on the most suitable mode of preparation of those which are used everywhere, but regarding which there is still much dispute. For this reason, your Committee have entitled their compilation :

A PRELIMINARY DRAFT OF A NATIONAL FORMULARY,

And they recommend that another year be devoted to further critical examination of the formulas presented, as well as of those contained in any other collections or drafts which have not yet been considered for want of time, or which may be presented by other bodies hereafter.

In case the Association adopts this recommendation, your Committee deems it of great importance that the same plan which has been followed during the preceding year should also be followed in the future, namely, that the Committee having the matter in charge should be so chosen that its members are within easy reach of each other, so as to be able to hold frequent meetings. A Committee scattered all over the United States may, perhaps, be perfectly successful in revising such a work as the Pharmacopœia—the draft of which is already in existence for the use of the revisers, who may distribute the work of revision among themselves. It is different, however, with a Formulary of Unofficial Preparations, which has to be, as it were, built up from the foundations, with material brought together from all points of the compass. There should be numerous helpers and agents in every State, but the working members of the Committee should be within each other's reach, and able to hold frequent meetings.

Your Committee finally recommends that the Association adopt some definite plan according to which the scope of the Formulary, its publication, subsequent revision, and other matters connected therewith, may be regulated, at least for a time, until more experience shall be available. For this purpose the following

PROPOSITIONS

Are respectfully urged upon your attention, with a recommendation that they be considered, and if found acceptable, approved.

I. *Scope of the National Formulary.*

The National Formulary, to be published under authority of the American Pharmaceutical Association, may contain the formulas of such preparations as have either been formerly official in the U. S. Ph., and have been discarded, though still in demand; or such as have never been official, but deserve recognition, because more or less generally in use. Among the latter may be any preparation contained in foreign pharmacopœias, if here is known to be a sufficient demand for them in any section of this country. It shall also contain the preparations belonging to so-called "elegant pharmacy," but it shall not be encumbered with purely technical, trivial, or fancy preparations.

2. System of Weights and Measures.

The National Formulary shall direct the quantities of the ingredients of such liquid preparations as are prescribed or administered by measure, in apothecaries' weight and U. S. measure. The same may be done in all other cases, but the system of "parts by weight" may be used where it appears to be more natural and convenient.

3. General Duties and Functions of the Committee.

A. The Committee to which is assigned the duty of preparing or revising the National Formulary shall take charge of all the documents regarding the matter which may be presented to the Association; and all associations or individuals are requested to forward their contributions, as early as possible, to the Committee.

The Committee is often compelled to decide between the merits of rival preparations, and heretofore it has been able to do this only by making the preparations itself. This method, however, has been found not to be sufficiently free from the risk of a failure to appreciate the particular meritorious feature that may be claimed for the preparations in question. It is deemed absolutely necessary that, in all doubtful cases, the proposer of a formula should furnish a sample of the preparation as made by himself. The Association, therefore, requests that when the Committee call upon any individual or upon any other Formula Committee for samples of any proposed preparations which it may need for reference and comparison, these samples be promptly furnished. And the Committee shall not be held responsible for modifying or ignoring formulas of preparations, samples of which have not been furnished when so requested.

B. The Committee having perfected the compilation of the National Formulary, or any subsequent Committee having accomplished its revision—in case the Association shall approve the work—shall supervise, and have sole charge of, the printing of the text of the Formulary. It is only when seeing the final text before them, with opportunity to refer at any time to formulas already passed upon and printed, that a harmonious text can be obtained. Each member of the Committee should receive a proof, the corrections should be compiled by the Chairman, and all matters that may be under dispute decided by a vote without delay. Hence, though a new Committee may be appointed at any meeting of the Association, the previous Committee shall not be considered discharged—if the whole text of the Formulary is involved—until it has seen its own work through the press. And the printing of the work shall be taken in hand immediately after the annual meeting. Arrangements for the printing shall be made by the Publication Committee of the Council.

Nothing contained herein, however, is intended to prevent any new Committee from organizing and beginning work immediately after its appointment.

4. Publication of the National Formulary.

The National Formulary, after being finally compiled and adopted, shall be printed in the Proceedings, and also in pamphlet form, in which latter shape it shall be kept for sale. [How frequently the Formulary, as a whole, is to be revised, and whether any needed additions may for several years temporarily be deposited in the Proceedings, or otherwise, may be better determined some time after the Formulary has been in use.]

5. Publication of the Preliminary Draft of a National Formulary Herewith Submitted.

The Draft of a National Formulary offered by your Committee shall be printed immediately after the present Annual Meeting, under arrangements to be made by the Publication Committee of the Council, and the printing shall be supervised by the Committee. In printing this Draft, economy of space is recommended to be studied, and formulæ which are already easily accessible in separate pamphlets should be only quoted by title (references being given), except when remarks are to be appended. This Draft of a

National Formulary shall be printed to the number of 250 copies beyond those required for the Proceedings, the separate copies being placed at the disposal of the Committee for distribution to outside Committees and to individuals.

Respectfully submitted,

CHARLES RICE,
WILLIAM P. DE FOREST,
P. W. BEDFORD,
S. J. BENDINER,
ADOLPH TSCHEPPE,
Committee.

New York, } September 3, 1886.
Brooklyn, }

On motion of Mr. Remington, the report was received and the recommendations contained therein were ordered to be taken up seriatim.

The first recommendation relating to the scope of the Formulary was on motion of Mr. Main, adopted; also on motion of Mr. Kuhn, the second recommendation relating to weights and measures; also on motion of Mr. Remington, proposition 3 A, and on motion of Mr. Hollister, proposition 3 B, relating to the duties and functions of the Committee.

Mr. De Forest read the fourth proposition, relating to the publication of the Formulary.

MR. COLCORD.—I move that the first portion be adopted. I do not see that we have anything to do with the second portion at present.

MR. HALLBERG.—I think it will be found eventually that the Committee should be continued from year to year, and at the annual meetings of the Association should make a report upon such formulas as have been found to be not entirely satisfactory, with a view to improve them, or upon such additions as different sections of the country might suggest. I think that is a very essential feature, and should be done, and I make that as a motion.

THE CHAIR.—State your motion again.

MR. HALLBERG.—My motion is that the Committee on Unofficial Formulary be continued from year to year, and that it make a report at each annual meeting of the Association, with a view to improving such formulas as have not been found satisfactory, and to suggest such additions or omissions as the wants of pharmacists generally throughout the country may require.

DR. RICE.—Mr. Hallberg's remarks are very much to the point, and the matter has been considered by the Committee, but no proposition has been presented, for the reason that the Committee did not know what the Association would do. I think it can best be done by making a new Committee on formulary. The special committee was appointed to do certain work; if we create another committee on formulary it should be their business to criticize the formulas, to collect new titles, work out new processes, and make a report at each meeting. These reports will have to be considered and the work continued until it is accomplished. Then you can instruct the committee for the following year to bring work to greater completion. The question will then come up whether you will appoint a new or continue the old committee. We ought to have a new committee on formulary, I think, by making an amendment to the By-Laws.

MR. HOLLISTER.—Mr. President, as we are now seemingly entering upon a little

matter of reform in the way of expenditures, etc., it occurs to me that it is not necessary that this National Formulary should be printed in the Proceedings as this section provides, and also in pamphlet form, but that the Proceedings should be relieved of a great deal of expense of publication. The practical pharmacist needs the formulary only in the pamphlet; that is a convenient, accessible form, and if it is published in the Proceedings that of course will be used as a reference. Now I ask, ought we not to do away with this additional expense of publishing it twice, as contemplated by this section?

MR. REMINGTON.—In reply to that I will simply say that this would be contrary to the spirit of the By-Laws. The members of the American Pharmaceutical Association are entitled to receive in its published Proceedings all important business that comes before it. That is one of the fundamental principles of this Association, and, therefore, whilst there may be no objection whatever to having it printed in pamphlet form, I submit it must go into the Proceedings as a regular part of the published report.

DR. RICE.—I can dispose of the question of cost in a very few words. If you print it in pamphlet form, it ought to be electrotyped, so that a new edition may be issued whenever called for. Having it electrotyped will cost very little, and a very small amount will be required for paper and printing to put it into the Proceedings. In this way the Association is relieved of any extra cost for composition.

MR. ROBERTS.—Whilst not strictly in order, I would like permission to ask a question of Mr. Rice, as to the object of making different strengths of strychnine elixir; one formula contains strychnine $1\frac{1}{4}$ grains, and another 2 grains, and still another 3 grains in one pint. The report says: "It will be necessary to establish a definite standard. The Committee decided that in all preparations where strychnine served purely as a bitter tonic, its dose should not exceed one hundredth grain in a fluidrachm. In other preparations, however, which are administered for the purpose of producing the characteristic therapeutic effects of strychnine, the quantity was adjusted at one fifteenth grain in the fluidrachm." This strikes me as being a very important matter, but I assume that the Chairman of the Committee can give some definite information on the subject.

MR. EBERT.—This is not in order.

THE PRESIDENT.—The gentleman is clearly out of order.

MR. EBERT.—In reference to the fourth proposition, I have a suggestion to make, that instead of having a committee of five for the publication of this formulary, we elect an editor or chairman, and I think Dr. Rice is the proper man. But the Committee should consist of such a number as is necessary for the proper revision of this National Formulary. Am I in order?

THE CHAIRMAN.—You are not in order. The question is the adoption of so much of proposition IV as is not contained in brackets.

Mr. Colcord's motion was adopted, and the fifth proposition, in reference to the publication of the preliminary draft of a National Formulary, was read.

MR. COLCORD.—I would like to ask for an explanation there, as to which committee shall supervise—the Publication Committee or the Formulary Committee?

MR. DEFOREST.—The Formulary Committee.

MR. COLCORD.—I supposed so, but it is a little ambiguous. I move that this section be adopted.

MR. HALLBERG.—Mr. President and Gentlemen, I think that while economy is to be considered in this matter, the number of formulas is not so great but what the work might be just as well pretty complete, and that any formulas which are to be incorporated should be published in their entirety, except formulas from foreign pharmacopœias, possibly. That is the only exception, I think, that ought to be made. The formulas will, perhaps, be found scattered throughout the literature of the last twenty years—in the reports of Mr. Diehl and others, in old volumes of the Proceedings, in journals and in formularies which perhaps are just as good as that presented. All these formulas should be gathered in one compilation, otherwise it will not be convenient; and in consideration of the fact that there are not a great many of them, possibly not more than two hundred—

MR. DEFOREST.—There are over three hundred; we have that number now.

MR. HALLBERG.—I move, as an amendment, that the Formulary be published in the Proceedings instead of in a separate pamphlet.

MR. DEFOREST.—I would draw attention to the fact that this merely refers to this year, and that next year, when the Formulary is finally adopted by the Association, it will be printed in regular form.

MR. HALLBERG.—I am aware of that.

MR. REMINGTON.—That is the point I rise to call attention to. Mr. Hallberg, and some of the other members of the Association, may not notice that there are two propositions here. Proposition IV refers to the publication of the National Formulary, and proposition V refers to the publication of the preliminary draft. I think the proposition as it stands is much the best; as to the preliminary draft, all that is necessary to do is to give references as to the manner in which the draft has been prepared.

MR. RICE.—We had a few Formularies printed last year, but I think it would be useless to reprint it now. We ought to save time and money by this preliminary draft. You may, if you choose, give the Committee permission to publish the Formulary in full. There are several other points in regard to the Formulary which it will not be necessary to report in full, but merely by titles—for instance, Elixir Quinine and Codeine.

MR. HALLBERG.—If I understand the object of this draft, it is to have a compilation of all formulæ, if possible, side by side so that the druggists throughout the country can see what they are and compare them. That can not be done if you publish one formula complete and then another simply by its title, or refer to it as having appeared in the Proceedings of a certain state Association. Who outside of the members of that Association will get it? What we want if possible is to have these formulæ side by side, so we can all judge of them, and come to some definite conclusion in regard to their comparative value; and as the expense will not be great, and the space will not be much, I do not see any reason why it should be curtailed at all.

An amendment to Mr. Colcord's motion to adopt was made by Mr. Hallberg, to substitute the words "foreign pharmacopœias for separate pamphlets;" but the amendment was not seconded. Mr. McIntyre moved to amend that the Committee have discretion in the matter, but withdrew his amendment, the chair deciding that the Committee would have discretion if Proposition V be adopted. Mr. Rice then, on the part of the Committee, asked leave to substitute for the words "*should* be only

quoted by title" the words "*may* be only quoted by title." The permission was given, and thus modified proposition V was then adopted.

Mr. Colcord made the motion that the Committee have another year for the critical examination of the formulas.

Regarding the proposition of the Committee, that the members of Committee having the matter in charge should be within easy reach of each other, Mr. Ebert moved, seconded by Mr. Hallberg, to amend that the chairman be appointed by this Association, and that the chairmen of similar Committees of the various State Pharmaceutical Associations be the other members of the Committee.

MR. COLCORD.—A Formulary Committee was appointed in Washington, and the members of the Committee selected to assist me in this work were scattered all over the length and breadth of the United States. In making my report one year afterwards, I had to report simply progress; nothing definite had been done, because the members were scattered all over the country, and they could not do this work satisfactorily. A new Committee was selected and has been working for the last two years, and we have seen the results of their work. It is necessary for this Committee to meet often and to compare notes; for if you have to do this by correspondence, nothing will be accomplished.

Mr. RICE.—Mr. Colcord has certainly supplied this Committee with valuable suggestions, and has corresponded with the Committee, and if he had been requested to act no doubt he would have done so. As to Mr. Ebert's suggestion that a matter of this kind should go all over the United States, I do not agree with it. Mr. Ebert is very kind to express his conviction that I would be impartial and fair in trying to carry on the work, and I thank him for the expression; but I would not accept such an office. I have not the time. It has now taken of my own time, and I do not exaggerate, an hour and a half every day for the last twenty-three months to finish the report, and I am only one of twenty working together. I don't care whether you appoint a local committee in Chicago or anywhere else; but unless they come together, and examine the reports sent out to the chairmen of the committees of the State Associations, which is a very good idea, unless you have a local committee, you will never have a report that is worth having. If at any time such Committee should give prominence to local matters to the disregard of formulas from elsewhere, you have the remedy in your own hands—discharge the committee and refuse to accept the report; but if you want work, you must appoint a local committee.

MR. REDSECKER.—Could not the committee be enlarged?

MR. DEFOREST.—The latter part of this suggestion reads: "Your Committee finally recommends that the Association adopt some definite plan according to which the scope of the Formulary, its publication, subsequent revision, and other matters connected therewith, may be regulated, at least for a time, until more experience shall be available." Also above, "There shall be numerous helpers and agents in every State, but the working members of the committee should be within each other's reach, and able to hold frequent meetings." The course adopted the last year was to correspond with every Association, whether State or local, that we could find in this country, and solicit from them all articles and formulas used in their vicinity. I do not believe it would be possible for a scattered committee to do the work; it must meet frequently to compare and try all formulas that are handed in.

MR. SEABURY.—I would like to say a few words in regard to the proper way, in my opinion, of conducting this committee's work. The idea of Mr. Ebert in regard to representation on the committee, I think is not in the interest of order. In the attempt to nationalize the work, of course we have got to have some experience to get into a very simple working order. The advantage of State representation is the point which he alludes to, which was a very good one indeed; I would approve of that; but it would interfere with the work of the National Committee on Formulary, therefore this same idea cannot be carried out in a legitimate way by State delegations coming before a National organization and making these suggestions, or making these suggestions to a regularly constituted committee of this National organization. If there is any weakness in the Committee's work, or if they want to add to it, they have the privilege of free distribution; so that when these questions come up in the course of time, each State will speak for itself, and the Committee have their conferences; the ideas are discussed, and if they are sensible and sound, they will be adopted. But it will create a great deal of confusion, in my opinion, if you add a man from twenty-eight States to the Committee; the Committee could not do the work, and there would be no head and no tail.

MR. RICE.—If the succeeding Committee has the object as much at heart as this Committee had, there will be no refusal on the Committee's part to correspond with any State Association, and entertain any suggestions that may be made. The Committee is asked especially to criticise and improve the work, and must vote on propositions; it will have to wait for answers. How can a report be gotten ready if the Committee must wait for answers from fifteen or twenty Chairmen of State Committees? Some may not be at home when the communication arrives—then there is a delay. My experience has been large in this direction.

MR. EBERT.—I want to make one man the head; that is why I designated Mr. Rice to select the different formulas for the National Formulary. I believe that one man, assisted by all the States, through the Chairmen of Committees of the different State Associations sending in their reports to him, is qualified to give us a better Formulary, by selecting according to his own judgment, than by doing it the way you proposed to do. I want to centralize on one man who will thus give us a National Formulary.

MR. HALLBERG.—Mr. President and Gentlemen, I do not want to underrate the abilities of the Committee who have gotten up this Formulary, but I wish to say that I think that you are making entirely too much of it. Any man with a proper amount of experience can get up a book of formulas like that without expending a great deal of time and labor on it. If he has the experience, he can do it.

A MEMBER.—I consider that a reflection on the Committee.

MR. ROBERTS.—I trust the gentleman will be permitted to proceed.

MR. HALLBERG.—I tell you, gentlemen, I could write a book of formulas like that Brooklyn Formulary in three days' time. (Laughter.) Now we have a number of State Associations that have contributed reports, and have Committees that can get up just as good formularies; therefore, I say the State Pharmaceutical Associations must be placed at least on the same basis as the New York and Brooklyn Committee, and I shall never consider that the Illinois, or any other State Pharmaceutical Association, is not just as competent, through its Committee. Every one of these Associations has a Chairman or a Formulary Committee, with experience and knowledge in that kind of business.

MR. MENNINGER.—The qualification of the different Committees is not before us.

THE CHAIR.—The question is on the formation of the Committee; the gentleman is in order—he can proceed.

MR. HALLBERG.—Their experience and their labor is to be taken into consideration just as much as any other work of the Committee. Therefore, I think that it would be no more than right and just that the Chairman or another member of each Committee on Unofficial Formulae of the various State Associations, be put on this Committee and have an equal voice in the matter with any other one man. Nothing else in the way of an amendment could I support, nor would I be allowed to support by the other gentlemen of the Illinois Pharmaceutical Association constituting our Committee.

The question was taken on Mr. Ebert's motion to amend, and it was lost. A motion made by Mr. Macmahon that the suggestion be adopted as presented by the Committee, was carried. A motion by Mr. Kuhn, that the report be adopted as a whole, and that the thanks of the Association be tendered to the Committee for its work, was likewise agreed to.

President Tufts occupied the chair.

Mr. Thompson read the following report of the Committee on the President's Address.

PROVIDENCE, *September 8, 1886.*

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen: Your Committee, to whom was referred the address of your President, to consider and report on the recommendations contained therein, beg leave to submit the following:

1st. The proposition to ask the co-operation of the American Medical Association to promote the use of official and non-proprietary medicines in preference to others, is approved.

2d. The President's suggestion to ascertain through a Committee if there be a better plan than the existing one for the management of the affairs of this Association, is also approved.

3d. While your Committee do not assent to all the arguments used in the address touching the question of a reserve fund, yet they do concur partly with the President in his views as to the advantages of reducing the expenses of membership, and have appended a resolution on this subject for your adoption.

4th. The President's proposal to submit queries to the State Pharmaceutical Associations, is deemed worthy of a fair trial. The details for its execution, however, should be arranged by a Committee for that purpose.

5th. Your Committee fully recognize the importance of issuing the annual proceedings at an early day, and submit a resolution for your adoption, with a view of accomplishing this object.

6th. The President's recommendation for the creation of a Standing Committee on United States Pharmacopœia, is, in the judgment of your Committee, deserving of your action.

7th. The President's suggestions concerning the eligibility of a member of the council to re-election, may be appropriately referred to the committee of five already provided for in this report.

8th. In reference to a motion now pending for the formation of a Committee on Materia Medica and Pharmacognosy, your Committee are of the opinion that the objects sought by this motion would be better accomplished by the Association resolving itself into a committee of the whole to do just this work.

9th. Your Committee fully concur in the President's criticisms on the useless multiplication of colleges of pharmacy, with its attending dangers.

To give force to the foregoing expressions, the following resolutions and amendments to the By-Laws are submitted for your approval and adoption :

Resolved, That this Association solicit the aid and co-operation of the American Medical Association in promoting the prescribing by physicians of official medicines only or such preparations as have published formulas, in preference to others, and that several State Pharmaceutical Associations make similar requests of their respective State Medical Associations.

Resolved, That a committee of five (5) be appointed whose duty it shall be to inquire if there be a better plan for the management of this Association than the existing one. Said committee to be appointed by the Chair, and to represent the various sections of the country.

Resolved, That the Committee on Publication are hereby instructed to have the annual proceedings published and ready for delivery on or before January first. And they are also instructed to omit from said publications any papers that may not be in their possession in proper time for the execution of this resolution.

Resolved, That Article I, Chapter VII., of the By-Laws be amended by striking out the word "four," on the first line, and inserting in lieu thereof the word "five," and by adding after the word "Market," on the second line the words, "And on the revision of the U. S. Pharmacopœia, each." Amend Chapter VII. by adding after the termination of Article 7, Article 8. This article to specify the duty of said Committee, the exact wording to be presented later.

Resolved, That the multiplication of colleges of pharmacy should be discouraged, except where the need of them is undoubted.

Resolved, That Chapter VIII, Article 3, of the By-Laws of the Association be amended by striking out the words "the sum of five dollars as an initiation fee and" after the word "treasury."

(While the Committee are not unanimous as to all the foregoing recommendations, they do agree in the main as to the entire report.)

All of which is respectfully submitted,

W. S. THOMPSON,
ALBERT E. EBERT,
S. A. D. SHEPPARD.

MR. SHEPPARD.—Although a member of the Committee, I rise to make a motion that the report of the Committee be received and that the recommendations be taken up seriatim, simply to bring the report into the possession of the Association. I would like to make an explanation in reference to the postscript. It was said by a gentleman here in the room last night that if that Committee agreed on any one point, he would agree to eat a pair of mules, horse, and cart. That Committee have agreed upon everything in that report except one little item, and that little item is about doing away with the initiation or membership fee, and on that Mr. Ebert and myself claim the privilege of speaking at a later time. The second reason why I wish to have the floor at this moment is to say to you something which probably does not belong in the discussion of the recommendations of this report, but which I claim concerns me personally. The President yesterday gave a large space in his address to a criticism of a report by the Chairman of the Committee on Finance on the recommendation of a permanent fund. Some elaborate arguments were given in opposition to that proposition. I wish to say a word about finance because it seems to me that it is perfectly proper as the Chairman of that Committee at this

time to make that defence, instead of bringing out the matter in the shape of a recommendation, which would not apply to any of the recommendations of the Committee. The report concerning the permanent fund was made in no hasty manner, and the Committee on Finance were unanimous in its recommendations. The Committee appointed yesterday were practically unanimous on the same point, as will be shown by the reading of one of the resolutions which they all agreed to, and which they later on modified in order that it might go into print in a smoother form. The Committee believed in the position of the Finance Committee that a fund properly established, will give permanence and stability to the Association. Now gentlemen, I feel that this is a very important question. We all know that there is a foundation-stone to almost every thing in the material world of civilized life, and that in almost all cases that foundation is money. The Finance Committee made that recommendation on this ground: that they believed a fund of twenty-five thousand or of fifty thousand dollars, would give permanent stability, because that would give to this Association a steady income of about one thousand dollars a year, which would serve to fill up any possible gaps or relieve any embarrassment. Our country is a very large one; east and west and north and south are very apt to have dissimilar views on a great many subjects. It is a well-known fact that there was a time when this Association was nearly bankrupt in the year 1872, or thereabouts; and there was a proposition made by some of the best men in the west, that they form a Northwestern Association, and let the American Pharmaceutical Association die out or do as it please. The great question is to guard against any splitting up of the National Association. There should be one strong Association, national and central, on a firm basis, and we, as practical business men, believe that money has something to do with it, and we think we should guard very strongly against any splitting off from the parent Association. This tendency will be neutralized if there is a fund. Then a man would say, that is good enough for me. There is a good strong body wherein I get more than my money's worth, I think I will stick to this old society, and these leaders have no good argument the other way. There is no good argument for splitting off. I want to say in the same connection, that I agree with President Roberts in almost every argument in regard to the advantage of poor men working in this Association; poor men with unpaid labors. That is exactly the drift of it, gentlemen. President Roberts was arguing on one line, and we were arguing on another. Now I argue that a poor man can afford to go into an Association that is strong, and they will be rather shy of an Association where there is a possibility of an assessment once in a while. Poor men are sensitive. Poor men are proud. They will not go where their pride or their sensitiveness is going to be affected. That is exactly one of the reasons why we want these men in, and that is why they will stay in if we have a strong Association. We can bring in right kind of men, who are able and willing to work, and though, perhaps poor, yet are proud and sensitive; we want them. I hope, gentlemen, that this Association will pursue the policy that it has been pursuing for the last seven years, allowing its reserve fund to slowly accumulate. I do not believe in taxing, in the sense that this word may mean, to any extent the present members for future generations. But I say, gentlemen, that if we can accumulate—and perhaps that accumulation may require ten, twenty or thirty years, or possibly not so long as it is a steady upgrade—we are all right and safe; and when we get to twenty-five thousand dollars I should say stop, but fasten that sum up so tight that it will take a vote of 95 or 99 out of 100 members present to change it. I believe the President was right when he spoke of the danger of having too much money. There is not much danger of having it, when it is locked up in a saving bank, and it requires three or four different signatures to get it out. On the other hand, it is a dangerous thing not to have it. For this reason the Finance Committee bring in the recommendation that we now take three thousand dollars out of the treasury, and lock that sum up in a fund where it will be hard work to get it out. That is the reason I am

occupying your time at this present moment. I now, sir, would renew my motion that this report be received, and that the recommendation therein be taken up seriatim.

MR. ROBERTS.—All I have to say is this, that my object in putting Mr. Sheppard upon the Committee was that he might express himself. The only difference between Mr. Sheppard and myself is that he is more liberal than I am—he has more faith in humanity. But as I said in my address, it may prove the means of disrupting the Association. Corruption is likely to creep in everywhere.

Mr. Menninger seconded Mr. Sheppard's motion, but desired that a time be named for considering the recommendations of the report.

Mr. Sayre moved to amend that the report be taken up for consideration on Thursday morning at 10 o'clock.

The amendment was accepted by Mr. Sheppard, and the motion thus amended was agreed to.

On motion of Mr. Kuhn, the Committee on Time and Place of the next annual meeting was requested to report immediately after the disposal of the report on the President's address.

A motion was made by Mr. Wellcome that the report on the President's address be printed for the use of the members. On taking the question, a division was called for, when the motion was agreed to by a vote of 48 ayes to 3 nays.

On motion of Mr. Macmahan the Association adjourned until 3 o'clock in the afternoon.

THIRD SESSION—WEDNESDAY AFTERNOON, SEPTEMBER 8TH.

President Tufts called the meeting to order at 3:30 o'clock. The minutes of the second session were read by the Secretary, and on motion of Mr. Menninger, approved. The minutes of the first session of the new Council were read by Mr. Kennedy, and likewise approved. The following business had been transacted:

FIRST SESSION OF COUNCIL, SEPTEMBER 8 (12 members present).

The organization of Council took place by electing W. S. Thompson, Chairman, H. J. Menninger, Vice-Chairman, and G. W. Kennedy, Secretary. The Standing Committees were constituted as follows:

Committee on Membership—G. W. Kennedy, Chairman; H. J. Menninger, A. E. Ebert, W. H. Rogers, and P. C. Candidus.

Committee on Finance—J. L. Lemberger, Chairman; A. H. Hollister, and W. S. Thompson.

Committee on Publication—H. J. Menninger, Chairman; C. L. Diehl, N. A. Kuhn, W. Saunders, and J. M. Maisch.

Committee on Centennial Fund—C. A. Tufts, Chairman; J. L. Lemberger, and J. M. Maisch.

Mr. C. L. Diehl was appointed custodian of papers read before the Association.

On motion of Mr. Sheppard, the Committee on examining the former Treasurer's books and accounts was discharged; Mr. J. L. Lemberger was made Chairman of the new Committee of Examination, with authority to complete the Committee, selecting two other members of the Association; the books and accounts of the former Treasurer were referred to this new Committee, to be audited before being turned over to the new Treasurer; the Committee of Examination was authorized to employ an expert for assistance, if in their judgment such assistance be needed; and the same Committee was authorized to send to each member a statement of his account as it appears on the books of the Association.

The applications of three candidates for membership were examined and referred to the Association, and the following candidates previously reported were duly elected:

Amos H. Caffee, Carthage, Mo.; Frederick Barnett Kilmer, New Brunswick, N. J.; Joseph G. Miller, Plainfield, N. J.

The credentials of the Kennebec Valley, Me., Druggists' Association, were read by the Secretary, and the accredited delegate was invited to a seat.

Mr. Nicot made some inquiries about the rules under which the Ebert prize is awarded, and spoke in favor of a rule that only such papers be considered in the award as are presented in competition for the prize. Mr. Eccles stated that several papers would be read this afternoon, if they were not compelled to compete for that prize. Mr. Markoe explained that the author of a paper had the unquestionable right to say that his paper was not for competition; he also referred to the action of the Association in 1876, when after a lengthy discussion on the propriety of criticising essays which had not been entered for competition, comments on the part of the committees were permitted on the successful essay only.

Mr. Eccles read two papers entitled "A Study of Peptonization," (see page 83), and "A Study of Pepsin," (see page 93). The latter paper contained the names of the different brands of pepsin examined, which the Committee on Papers and Queries had desired the author to omit, in accordance with the practice hitherto followed. A motion of Mr. Kuhn was adopted after some discussion, that the names be given to the Association. The advisability of publishing these names in the Proceedings occasioned a lengthy discussion, and it was finally decided on motion of Mr. Sheppard that the question of publishing the names be left to the judgment of the Publishing Committee.

MR. HALLBERG.—MR. President, much as I like to listen to a contribution of this kind, I think that great care should be exercised in selecting the brands of the various pepsins for experimentation, so as not to put any manufacturer's ware under any unfair disadvantage. I think that Dr. Eccles should have taken into consideration the fact that the compound pepsins ought not to be classified with the pure or saccharated pepsins. The former are entirely different, and the manufacturers do not claim for them the same action that is claimed for pepsin under some conditions. In other words, while you may measure the action of pepsin or its pure preparations by its power of digestion when treated in connection with coagulated egg albumen at a certain temperature, you cannot

arrive at the true value of the digestive power of the compound pepsins under the same conditions. You must vary the conditions; you must try their action on other substances beside egg albumen. It is no more than fair that their compound nature should be taken into consideration. If I am not mistaken, I have seen it stated somewhere that in acidulated solutions ingluvin does not have its greatest medicinal value. Some of these preparations have secured a large use among physicians.

MR. ECCLES.—I took all these facts into consideration. These preparations have all been compared merely in regard to their action upon albumen, and all I aimed at was to give the value of this power of the different pepsins.

MR. HALLBERG.—I beg your pardon. The manufacturers do not claim that compound pepsins have this power alone; but they are supposed to be artificial representatives of the digestive juices.

MR. ECCLES.—I state that in the paper. Allow me to draw an analogy, and perhaps the gentleman will understand my position. If a prescription is sent to ten stores, calling for bichloride of mercury in a certain proportion, and a chemist attempts to analyze the mercury, it is not necessary to consider all the other ingredients provided he says that he is looking for mercuric chloride only, and then the medicine is condemned if in this one respect it does not come up to the formula.

MR. EBERT.—The point that Mr. Hallberg wishes to make is not to defend these preparations, but that they should not be compared with pepsin. Now the question is whether we do not commit a wrong by bringing in those preparations which are not claimed to be pepsin, but which in many instances are simply nostrums.

MR. HALLBERG.—I think I made myself very explicit. I can extend my remarks if the Association likes to hear them. The point was this—that while the value of pepsin as a measure of digestive action is its power of peptonizing egg albumen, the value of these compounds depends upon their different qualities; first the conversion of starch into sugar, second the conversion of albumen into peptone, thirdly, the splitting of the fats into glycerin and fatty acids, and an action similar to the process of emulsifying. In the form of emulsions there is a prompt and ready absorption of fat. Now there are three distinctive properties, and there is no use sneering about these preparations, because physicians will frequently prefer them to many of the pepsins. Perhaps we cannot upon strict pharmaceutical grounds declare that they are more active or better than pepsins, and we have to take the judgment of physicians. They will have these preparations, because they can get better results from them than they can from pure pepsin alone. It is our business as pharmacists, as far as the profession allows us, to cater to the legitimate wants of the medical profession, and this Association should not do anything to encourage any animosity on the part of manufacturers or between pharmacists and physicians.

Mr. Painter read a paper on spirit of nitrous ether (see page 61) which on motion of Mr. Markoe was accepted with thanks and referred.

A MEMBER.—Is there any destruction of the rubber?

MR. PAINTER.—Very little; but there is more destruction of the cork, and this is a serious objection; but plaster of Paris kept the ether from escaping and made the joints fast.

A MEMBER.—Why not use paraffin?

MR. PAINTER.—Paraffin will not do: it is dissolved by the ether. I found some of the corks coated with paraffin when I tried the experiment, had the coating dissolved and the cork flew out. It is difficult to preserve nitrous ether in its pure state. You cannot close the bottle with an ordinary stopper, but the ether will soon be half gone. If it was kept in a cool place and the cork smeared with glycerin, it was preserved for a considerable time; but after a month, two out of the seven bottles began to evaporate, even when coated with glycerin and the best ground stoppers. Then I took some commercial preparations of which I have samples here, which were kept perfectly even without smearing the stopper with glycerin, showing that they were not so volatile as the product made by me. Not one of them would boil at the same temperature. The weather was warm and not favorable for determining the boiling point.

MR. SHEPPARD.—I would like to make one practical observation. Our members know how destructive this product is to everything except glass. I have often used with good results some of the different forms of asbestos as it is furnished to us in the market. It has proved very satisfactory for packing joints; this can be covered with plaster Paris or with cement made by the old fashioned formula, one part rubber and two parts linseed oil. If a joint is treated in this way, putting the cement over the asbestos, it will stand almost anything. That is a point worth knowing.

MR. DIEHL.—I have listened to the paper read by Mr. Painter with great pleasure. It is very desirable that we should have a spirit of nitrous ether that accurately represents a certain proportion of pure nitrous ether. A number of years ago I made some experiments with a view to obtaining a uniform spirit. I believe the experiments made at that time for securing a uniform product, provided the directions of the Pharmacopœia are carried out, do not prove for one moment that the nitrous ether separated upon agitation with a certain proportion of ice cold water, was pure ether. I was very well aware that this ether was impure and contained an indefinite proportion of nitrous ether, and the revisers of the Pharmacopœia also were thoroughly aware of it. I think that there was a mistake made somewhere in differentiating the absolute amount of ether contained in the officinal spirit of nitrous ether obtained by the pharmacopœial process. If I remember right it is defined as a spirit containing 5% of crude nitrous ether, and further on, in speaking of the tests, the Pharmacopœia states that the permanganate test indicates that the spirit contains about 4% of pure nitrous ether. I don't think it contains that much, but probably less than 3%. The point that I wish to particularly call attention to, is that we have before us as pharmacists the formula of the Pharmacopœia, and that we should follow that, as long as the present Pharmacopœia exists. Although a spirit of nitrous ether as made by this process is very desirable, it is not the preparation of the Pharmacopœia, and cannot be so long as it is not identical with the product of the U. S. P. However, the spirit ought to be made with pure nitrous ether.

MR. ECCLES.—I have listened with pleasure to the remarks of Professor Painter and it struck me that an excellent way for preserving concentrated ethers like nitrous ether, would be to have it in sealed glass vessels which could be used for making the spirit of nitre. As to the preservation of spirit of nitre, very few druggists take any pains with it. Samples after three times opening of the bottle have been found to contain only half the amount of ether: this loss was from evaporation. I have found samples sold from stores in different parts of New Jersey and in Philadelphia, which contained only a fraction of one per cent. I was not aware of the point Professor Painter has given us, that paraffin is soluble in nitrous ether. I never tried it. The plan I have pursued is a very good one for preserving the spirit of nitrous ether for a great length of time without evaporation. I dip the stopper in the paraffin, and coat it also on the outside, and then put the vial into an ice-box, only having an ounce to four ounces of spirit in a bottle. I kept

none in a stock bottle, but all in the ice-box, in small bottles which could be taken out as required.

MR. DIEHL.—Dr. Eccles is correct as to spirit of nitrous ether. I don't think it will dissolve paraffin, and I do not understand him to say so, but it is the pure ether that will do it. I am in the habit of preserving a pure ether in a similar way in a well stoppered bottle. We have occasion to use bottles in which Dr. Squibb sends his chloroform out; they accumulate when empty, and we use them for this purpose; the half ounce size is excellent for spirit of nitrous ether. Spirit of nitrous ether after it has been opened will not keep very long; it does become acid. But I have kept it for a year in these bottles, the stoppers being painted with paraffin on the outside, and it was just as free from acid then as when first made. The washing with water secures the removal of the aldehyde as well as the acid. Very little acid remains and no aldehyde, or so little that it will scarcely respond to the test, if made entirely according to the directions of the Pharmacopœia. If allowed to remain open for two or three days, it becomes acid, and the more so, of course, the longer it remains open.

MR. MARKOE.—I can for one see no objection to using pure nitrous ether in the manufacture of the spirit of nitrous ether. It has been pretty well determined now that the official product contains from $2\frac{1}{2}$ to 3 per cent. of nitrous ether. If this process proposed by Professor Painter will give us absolute nitrous ether, we cannot do better than to carry it out. I cannot see why we may not dilute that with alcohol, and make a mixture that shall respond to the official tests. Why go to work and make a necessarily impure product by a faulty process, when we can make the pure product by a good process, using pure nitrous ether and pure alcohol in the preparation, so that in strength it will come up to the standard of the Pharmacopœia?

MR. PAINTER.—It would appear to me that the present spirit of nitrous ether is a compound spirit of nitrous ether, since it contains various other undetermined products. That is the medicinal agent that has been used for so long a time, and described by the various Pharmacopœias. If we could find out its constituents, and determine a method by which we can make it always uniform, there would be something gained. To determine what it is, seems to be a very difficult matter. Experiments have been all based upon the quantities of nitrous ether the products contain, which is certainly a remedial agent. Most processes have been examined, and all seem to be faulty, according to my observation; some were found to contain merely a trace of nitrous ether, and yet seem to be in a degree satisfactory as remedial agents. It has been my aim to devise a method of producing a uniform product.

On motion of Mr. Ebert, the Association adjourned until Thursday morning at 9 o'clock.

FOURTH SESSION—THURSDAY MORNING, SEPTEMBER 9TH.

The Association was called to order at $9\frac{1}{2}$ o'clock, President Tufts in the chair. The minutes of the third session were read by the Secretary, and on motion, were approved. The minutes of Council were read by Mr. Kennedy, showing that the following business was transacted:

Second Session of Council, September 8th (9 members present).

The stenographer's bill for \$100 was approved and ordered to be paid after the completion of the work.

One application for membership was examined and ordered to be reported to the Association.

The following three candidates previously reported were duly elected:

Edward R. Beckwith, Petersburg, Va.; Gilbert Snowden Cook, Somerville, N. J.; John C. Nichols, New London, Conn.

The minutes of Council were, on motion, approved.

The credentials of the Pittsburgh College of Pharmacy were read by the Secretary and accepted.

Mr. Redsecker offered the following resolution :

Resolved, That in addition to the five members from New York and Brooklyn, there shall be appointed one person from each State Pharmaceutical Association here represented, all of whom shall constitute the Committee on Unofficial Formulas; and that five members shall be a quorum for the transaction of business.

MR. REDSECKER.—My object in offering this resolution has been to get as much assistance from the various State Associations as possible, and thus to make the Committee on the National Formulary as national as possible, so there can be no possible cause for saying that it was simply a local affair. At the same time it don't hinder the Committee in their action whatever. Under the action of yesterday, five members will be from New York and Brooklyn, and I suppose there will be a re-appointment of the old Committee. They would still have power of acting, even if the other members do not, but the other members can offer suggestions to the Committee, and in that way the Committee can prepare a National Unofficial Formulary. That is my reason for offering the resolution, and I have done it without any consultation with others. It does not re-open the whole subject, but merely adds to the numerical strength of the Committee.

MR. ROBERTS.—It strikes me that it would be very acceptable by having the different Pharmaceutical Associations represented on this general committee for the revision of the Unofficial Formulary. I would suggest as an amendment, instead of saying Association here represented, that any State Association may be represented through a proper committee.

DR. RICE.—The resolution just offered is, in my opinion, as perfect as it can be made. It covers the whole case. The Committee which did this work does not wish to deprive itself of any assistance from any State Committee, or from the members. Let us have them all; place them upon the committee. We only wanted to impress upon you the necessity of not hampering the Committee by compelling all the members to be present, or entitling them to vote. We will be glad to have them in addition to the five members from one locality, provided these are still able to work. To enable the Committee to do considerable work, it is proposed to enlarge it in this way, and that is the best we can do. If you leave the final work to be done by a quorum of five, I want to repeat what was said last year, that this Committee should be located in different parts of the United States, and should be changed every year or two years, when it has completed its work. Then reorganize the Committee by locating it first, say, in the West and then in the East. We recommended that last year. Next year the Committee will cease to exist, because it should not continue any longer.

MR. ROBERTS.—My idea in offering this amendment was that all the State Pharmaceutical Associations might be represented, and that the New York and Brooklyn members should decide all questions; that the other members should be merely adjunct or advisory members. There must be a head or authority, and I think that that authority rests

very well where it is at present ; but they cannot be harmed by advice coming from the various parts of the Union. That is the reason why I wanted every Pharmaceutical Association to be heard, not upon the final vote as to what shall or shall not be, but merely to aid the Central Committee in coming to a just decision.

THE PRESIDENT.—Does Mr. Redsecker accept the amendment, to make them advisory members ?

MR. REDSECKER.—No sir. I do not think that is proper. My object is to still keep the balance of power in the hands of these five men, because it is not likely that members from all parts of the United States will come to these committee meetings. Still it does not hamper these five men, who have been doing the work, from acting, but it brings to their aid these other men. If they want to attend the meetings, let them come as full members; they would not wish to come simply as advisory members. I suppose that all are willing to take advice of persons who are not members of that committee.

MR. WELLS.—I rather favor Mr. Roberts' amendment. We should have advisory members, for this reason: every locality in the States has a book of formulas. Now, by having advisory members, they recommend such formulas as the Committee may not have embraced in their formulary.

MR. REMINGTON.—I think there can be no difficulty about this question. The Committee of the New York and Brooklyn Formulary has done a great deal of good work. That work is recognized by the Association. The Association has substantially adopted the work of this Committee. Now I gather from the remarks of Dr. Rice that the Committee desire that this Formulary shall receive recognition all over the country, and shall become national in its scope. The Committee themselves approve that instead of having it localized, the name New York and Brooklyn be dropped, and I notice in this draft they have presented it is dropped; they want it known as the National Formulary, and I think that no one can object to the nationalizing of this Committee. A National formulary requires a National Committee in order to secure acceptance, therefore I do not think there will be any trouble coming from the adoption of Mr. Redsecker's resolution. The local Committee who carry on the comparative experiments are the working members. I do not think it is the desire of any one in this Association to supplant them in their work. They have presented their work to the Association, and now the idea is to make it National.

MR. MARKOE.—I agree with Prof. Remington as to the desirability of making this a National Committee. I do not see how it can work for effective acceptance without being so, and I cannot see how a man can be a member of the Committee without having a right to vote. I think that no one would be better pleased than the members of the Committee, if they could feel assured that additional members were to be appointed from the several Pharmaceutical Associations who would take an interest in it and would discuss with the central Committee the points at issue, help them by their advice, and by their votes; and therefore I hope that the Association will not make the mistake of making the members of this Committee merely advisory; they should be acting, voting members; I should insist on that point.

THE SECRETARY.—The resolution offered by Mr. Redsecker is, that one member of the State Associations here represented shall be added to the Committee.

MR. REDSECKER.—I modify that by saying all State Associations.

THE SECRETARY.—That will cover the ground sought to be covered by Mr. Roberts, I believe.

MR. ROBERTS.—No, sir; I wish these additional members not to have the full power

of members. I wish the Brooklyn Committee, if I may so term it, to have the power of final decision, and my amendment is that those gentlemen who represent the various Pharmaceutical Associations hold the relation of, and be merely received as advisory members, having full power as members of the Committee, excepting in the final decision as to the report of the Committee. That is the position I take, Mr. Chairman.

The question being on the amendment offered by Mr. Roberts, it was not agreed to.

The motion of Mr. Redsecker was then adopted in the following form:

Resolved, That in addition to the five members from New York and Brooklyn, there shall be appointed one person from each State Pharmaceutical Association, all of whom shall constitute the Committee on Unofficial Formulas, and that five members thereof shall be a quorum for the transaction of business.

The hour having arrived for considering the report of the Committee on the President's Address (see page 169), Mr. Menninger moved the adoption of the whole report. Mr. Ebert stated that the committee were unanimous on all the resolutions offered except the last one.

Mr. Menninger thereupon modified his motion to adopt by embracing all the resolutions except the last one. The motion was agreed to.

MR. EBERT.—I move that the last resolution be amended so as to read, "*Resolved*, That Chap. VIII. Art. III. of the By-Laws of the Association be amended by striking out the word 'five,' and inserting the word 'two,' so as to read 'the sum of *two dollars* as an initiation fee.' " It is absolutely necessary not to cut off all our resources, and two dollars is certainly very low; it is a sum all can afford to pay.

Mr. Ebert's motion was seconded by Mr. Menninger, and this was followed by a lengthy discussion, in which Messrs. Roberts, Seabury, Remington, Thompson, Canning and Bedford spoke in favor of and Mr. Macmahan against abolishing the entrance fee; Messrs. Sheppard, Candidus and Markoe for retaining the fee at the present figure; Messrs. Maisch, Diehl, Rogers and Wellcome, in favor of the reduction as proposed by Mr. Ebert; while the reduction of the entrance fee to \$2, and also the reduction of the annual fee to \$3 was advocated by Mrs. Rosa Upson, Messrs. Colcord, Holmes, Hallberg, Baker and Hollister. During the discussion Messrs. Colcord, Mason, Macmahan and Wellcome spoke of the causes for the lower dues and lower expenses of the British Pharmaceutical Conference, and Messrs. Menninger, Ebert and Remington made allusions to the financial difficulties in which this Association has been at various times, and as late as 1880.

The amendment to the amendment which had been offered by Mr. Colcord, to reduce the initiation fee to \$2 and the annual dues to \$3, was declared to be out of order, as introducing another subject entirely, foreign to Chap. VIII. Art. III. of the By-laws. The question was then taken on the amendment offered by Mr. Ebert, when 61 members voted in favor and 39 in opposition to the motion.

The original motion of the committee, as amended by the motion of

Mr. Ebert just carried, was laid before the Association and adopted as an amendment to the By-laws by a rising vote, 94 voting in the affirmative and 6 in the negative.

On Motion of Mr. Deforest, the report of the Committee on the President's Address was now adopted as a whole.

The Committee on the President's Address then presented the following new Article VIII, of Chapter VII of the By-laws, as previously announced :

Article VIII. It shall be the duty of the Committee on Revision of the United States Pharmacopœia to collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which officinal and non-officinal remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and feelings of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia.

The amendment was adopted with no dissenting vote.

Mr. Colcord gave notice of an amendment to the By-laws, Chap. VIII, Art. IV, reducing the annual dues from five to three dollars; and Mr. Day a similar notice of an amendment to Chap. VIII, Art. III, to strike out the words "the sum of *two dollars* and ;" also the word "sums," and to insert in place of the latter the word "sum."

Mr. Roberts called up the amendment to Chapter IV, Article IV, of the By-laws, which had been offered at the second session by Mr. Sheppard, reducing the Treasurer's salary from \$750 to \$600.

Mr. Wells, from the Committee on the Time and Place of Next Annual Meeting, read the following report:

MR. PRESIDENT AND OFFICERS AND MEMBERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION :

The majority of the members of your Committee appointed to report a place for the next annual meeting of this Association, would respectfully recommend Cincinnati.

To this Committee was also referred the report of your special committee for ascertaining the wishes of our members as to the time of the annual meeting. From said report, we ascertain that 781 members responded, and of this number 345 members prefer the month of September for holding the annual meeting, 145, the next highest number, favoring the month of August.

Signed,

J. W. WELLS,

P. W. BEDFORD.

Mr. Painter read the following minority report:

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

I beg leave to present a minority report. It having been under serious consideration for the past several years to hold our annual meeting on the Pacific Coast, and this location not having been heretofore selected, mainly for the reason of the comparatively high fares prevailing, a minority of your Committee is of the opinion that an opportune time now presents itself to secure the most favorable rate in fares that will be apt to occur in many years to come, and that if this Association ever intends to accept the oft-repeated invitation of our fellow-members west of the Rocky Mountains, a better opportunity will probably never occur again. A minority of your Committee further respect-

fully state that it is their conviction that this Association is now prepared to hold a large and a most successful meeting in San Francisco, which, it is believed, will redound to the best interests of this organization, widening it in its scope, and making it a more liberal and progressive body. It is doubtful if a single member questions the wisdom of having met in Canada a few years since, although New York City would have been more convenient for a large majority of the members. In like manner it is believed that the far West should be more substantially recognized, and come in for a share.

The lowest fares that have ever prevailed between the East and San Francisco, have been made this year to the Grand Army of the Republic; they paid but \$50 for the round trip from Kansas City, and \$80 from Boston. It is hardly probable, however, that so low a rate can be secured for our Association next year; yet it is reasonable to expect that the round trip will not exceed \$75 from the Missouri river at the very outside.

It has been duly considered and ably argued in the Committee, that many of our members would be deterred from attending by the expense of the trip; but on the other hand, it is quite safe to say that many others of our members (and possibly as large a number) who would not otherwise attend the meeting, would avail themselves of this favorable opportunity to make a desired visit to the Pacific Coast.

A minority of your Committee report, therefore, in favor of holding the next annual meeting in San Francisco, California, and designate the first Tuesday in August as the most suitable time for the Convention to assemble in that locality.

Respectfully submitted,

EMLEN PAINTER.

The Secretary also read a communication received this morning from the Detroit Pharmaceutical Association, inviting this Association to hold its next annual meeting in the city of Detroit.

Mr. Kuhn moved that the thanks of the Association be tendered to both the majority and minority of the Committee, and that the majority report be adopted, substituting, however, Put-in-Bay for Cincinnati.

The chair ruled the motion out of order until after the disposal of the minority report.

Mr. Colcord moved that the thanks of the Association be tendered to the pharmacists of California for their renewed invitation, and that the minority report be received, but not adopted.

Mr. Ebert moved the adoption of the minority report, and spoke in favor of meeting in California; also Mr. Painter. The motion was opposed by Messrs. Menninger, Alexander and Redsecker, on account of the time and expense connected with a trip to California, which altogether would occupy about thirty days, at a cost of not less than \$500 or \$600 for each person. It was also stated that June was probably the most favorable month, as far as the scenery of the Yosemite and other regions was concerned.

The question being taken on the adoption of the minority report, the motion was lost by a vote of 26 ayes to 59 nays.

Mr. Kuhn then renewed his previous motion to amend the majority report by inserting Put-in-Bay for Cincinnati.

The motion was discussed at considerable length by Messrs. Kuhn, Macmahan, Eliel, Haber, and Seabury, in favor, and by Messrs. Bedford,

Candidus, Remington, Painter, and Johnson, in opposition to the amendment, which was lost by a vote of 23 ayes and 63 nays.

Mr. Colcord moved to amend by substituting Detroit for Cincinnati, which motion, without further debate, was lost by 46 affirmative against 50 negative votes.

The report of the Committee was then adopted.

Mr. Painter moved that the next meeting be held on the first Tuesday of August. Before the motion was seconded, the subject was, at the suggestion of Mr. Sheppard, deferred for the present.

The chair, in conformity with a resolution appended to the report on the President's Address adopted this morning, appointed Messrs. Remington, Thompson, Alexander, Macmahan, and Sheppard, a Committee to consider and report on the future management of the Association.

Mr. Thompson referred to the action of the Association at the meeting of 1883, when the question of memorializing Congress for an appropriation for the introduction of medicinal plants, had been referred to the Council, and stated that he had been assured by the Commissioner of Agriculture of his anxiety to have in this matter the advice of this Association.

Mr. Sayre moved the appointment of a suitable committee to confer with the Department of Agriculture in regard to the introduction of foreign medicinal plants into the United States.

The motion was agreed to.*

On motion of Mr. Bartlet, it was voted that the afternoon session be exclusively devoted to the reading of papers; and, on motion of Mr. Thompson, that the afternoon session close at five o'clock, for the purpose of holding another session afterwards.

On motion of Mr. McElhenie, it was resolved that the present session close at one o'clock, and that the afternoon session begin at two o'clock.

Mr. Macmahan moved that the next annual meeting convene on the second Monday of September, 1887, at two o'clock p. m. Amendments were offered by Mr. Nicot, to meet on the second Monday of August; by Mr. Alexander, to meet on the last Monday of August; and by Mr. Saunders, to convene on the first Tuesday of September, in the morning. The amendments were lost, and Mr. Macmahan's motion, modified by the mover to meet on the first Monday of September, was then adopted.

Mr. Greve resigned as a member of the Committee on Legislation, stating that his name had been incorrectly reported, and that Mr. Day, of

* The resolution not having designated the number of which this committee shall consist, the President, with the view of representing the different localities, appointed the following seven members: Joseph W. Colcord, Lynn, Mass., Chairman; Charles Mohr, Mobile, Ala.; Emil Scheffer, Louisville, Ky.; William Saunders, London, Canada; Jacob C. Huber, Fond du Lac, Wis.; Robert J. Brown, Leavenworth, Kan., and James G. Steele, San Francisco, Cal.—SECRETARY.

Springfield, Ill., had received the nomination. Mr. Greve's resignation was, on motion of Mr. Bartlet, accepted. On motion of Mr. De Forest, the Secretary was instructed to deposit an affirmative ballot for Mr. Day, and Mr. Day was declared elected.

Mr. Diehl moved that the introductory portion to the Report on the Progress of Pharmacy be referred, without reading it, to the Publishing Committee, together with the report. The motion was not agreed to.

Mr. Painter moved that the Committee on Papers and Queries be authorized and empowered to have all papers presented to the Association printed before being read, and that printed copies of each paper be circulated amongst the members prior to the time of reading the paper. Mr. McElhenie seconded the motion, which, on motion of Mr. Ebert, seconded by Mr. Saunders, was referred to the Council.

Mr. Markoe moved that a committee of three be appointed to draft resolutions of sympathy with the sufferers from the effects of the recent earthquake at Charleston, S. C. The resolution was adopted, and the President appointed the committee, consisting of Messrs. Markoe, Bedford and McDonald.

The chair stated that the members of the Committee on Unofficial Formulas to be appointed in addition to the five members from New York and Brooklyn would be appointed at another time.*

The hour of one having arrived, the Association adjourned.

FIFTH SESSION—THURSDAY AFTERNOON, SEPTEMBER 9th.

At 40 minutes past 2 o'clock, when more than a quorum of members was present, in the absence of the President and Vice Presidents, the Secretary was requested to call the meeting to order, and Mr. De Forest moved that Mr. Emlen Painter be elected temporary chairman. The motion was adopted and Mr. Painter took the chair.

The Secretary read the minutes of the fourth session, and there being no corrections to make they were approved.

Preparations for an evening entertainment in the hall where the sessions had thus far been held, being in progress, the Association adjourned to another hall in the same building, and Mr. McElhenie read a paper on the "Pharmacy of Hydronaphthol" (see page 48), and exhibited a number of specimens in illustration of the antiseptic effects of this chemical. The paper was referred for publication.

* At the request of the President, the Permanent Secretary, early in October, addressed the Presidents of the different State Associations, requesting the nomination of an efficient member for this work. At the time of going to press, nineteen nominations have been received. The committee complete will be announced in the preliminary pages to this volume.—SECRETARY.

MR. SAYRE.—I would like to ask if Mr. McElhenie has made any practical experiments in order to determine the utility of the chemical for the preservation of meat—whether a solution containing one part in ten thousand would be sufficient for that purpose.

MR. McELHENIE.—I have not decided that point. I have only imagined there would be enough dissolved by the juices of the beef to protect it.

MR. BARTLET.—Has Mr. McElhenie made any experiments with it for preserving milk?

MR. McELHENIE.—The preservation of milk is hardly in the line of pharmacy. I have not made any experiments in that line.

MR. ECCLES.—It must be much superior to boroglyceride. I have tried hydro naphthol in the preservation of several things, and I find that its antiseptic power exceeds that of boric acid or glycerin. I think one part in ten thousand is hardly enough for preserving beef. As far as my experiments go, it is not much better than salicylic acid or benzoic acid; it exceeds these in power a trifle, but nothing like the amount indicated. I am still of the opinion, after repeated experiments made and reported last year at the meeting at Pittsburgh, that the best protective of all is one that the people through prejudice are afraid of, and it is a sheer prejudice. I have succeeded in preserving solutions since about the first of May or the latter part of April, 1885, and they were when I left home, still perfectly protected, with one part of corrosive sublimate in ninety thousand. I find it exceeds everything so far as protective power is concerned. In the proportion in which it would be used internally, the dose would be infinitesimal; it is perfectly harmless in that proportion. Corrosive sublimate will be safer to give than boric acid of the same protective power. Then boric acid is as safe or perhaps safer than glycerin, and with the same protective power you would have to use very much more of these articles. As far as the non poisonous quality of hydro naphthol is concerned, I have not heard to what extent it can be used without any injurious effects.

MR. McELHENIE.—I will say, Mr. Chairman, that I saw Dr. Lawrence Wolff three weeks ago at his office in Philadelphia, and he detailed to me the experiments he made at Jefferson Medical College. In one case he gave as much as 10 grains to a rabbit, beginning with small quantities first, and then he and his friend took from five to ten grains apiece, with no noticeable effect at all.

MR. SAYRE.—I have learned recently that beta-naphthol has been put up as hydro-naphthol. We know from experiments that beta-naphthol is poisonous, while hydro-naphthol is not poisonous. In one of the recent experiments by Dr. Fowler two or three weeks ago, he produced death in two hours' time with beta-naphthol, while in the same room a rabbit remained as lively as ever under the influence of hydro-naphthol.

President Tufts occupied the chair.

A paper by J. U. Lloyd on *Dioscorea bulbifera*, was read by title and referred for publication. (See page 127.)

Mr. L. F. Stevens read a paper "On Ginger in Soluble Essence," (see page 42) and exhibited numerous samples of the products obtained by his experiments. The paper was accepted and referred.

MR. SHEPARD.—I can hardly let the paper go by without saying a word for it, and would speak particularly of the gratification we should feel that gingerol is being investigated. Very little has been known about it. Let us work with it more and more. Here is the first wedge.

MR. ECCLES.—Have any physiological experiments been made to find out the actual effects? A great many things come to us from rumor, and yet upon test of experience they fail. I will state that as far as the paper is concerned, much of its contents I had from Mr. Stevens before, and I was very much interested in the experiments he was performing. He can get along with small facilities and do good work with less apparatus than any man I know of. He devises his apparatus as he goes along, out of anything that comes into his hands.

MR. BARTLET.—What is the strength of this sample?

MR. STEVENS.—This contains a little less of gingerol, but has all of the aroma, and all of the therapeutic properties of ginger in the same dose.

MR. BARTLET.—If it has all the strength, it will take the place of the officinal tincture of ginger.

MR. STEVENS.—Yes, I think so; but you know, when pungency is wanted, capsicum is often taken for that.

MR. HALLBERG.—I am glad that processes for pharmaceutical preparations are becoming recognized upon the basis of pharmaceutical manipulations required, more than upon the chemical manipulations which of recent years have encroached considerably upon such preparations. We want the drugs represented in various vehicles, and to preserve in the syrup for instance the constituents as nearly as possible in their natural form. I have always regretted the treatment of resinous drugs with alkalies. While it seemed to yield elegant preparations, it was decidedly objectionable at least upon therapeutical grounds, if upon no other. I think that this paper will also have a bearing upon formulas upon which some of the processes in the last pharmacopœia have been constructed. The syrups have received a good deal of criticism, particularly in regard to the manipulations. This process proves that with the drug in a tolerably pure and concentrated form, nothing more is required than its very fine division so as to insure the greatest solubility possible in the menstruum suited for the finished preparation, without the intervention of alkalies or similar agents. Of the officinal formulæ, for instance that for syrup of tolu has been much criticized; at the same time, if we apply the same principle we find that the formula is a correct one. The officinal process in that case might be still further improved by putting the drug in a form in which it would be more divided, more distributed, so that the solvent would act as favorably as possible. I think that is the point suggested by this paper in a general way, and that chemical processes, as I styled them, for pharmaceutical preparations, should be avoided if possible; these preparations should represent the crude drug in as unchanged a form as possible.

MR. ROBERTS.—I think, Mr. President, that it is a misnomer to call that preparation a soluble extract of ginger. It represents but one portion of the drug; it is a very pretty aromatic preparation, but I doubt very much whether it has the therapeutical value of the root. I agree entirely with Mr. Hallberg, that pharmacists in their effort to make elegant preparations, should be very careful not to drop any of the valuable properties of the drug while seeking to present a more presentable preparation for the palate of the public.

A paper entitled "On Paste for Labeling," was read by Mr. Leo Eliel, in answer to Query 83 (see page 50).

Mr. E. M. Hatton's paper, "On American Carbolic Acid," was read by title and referred (see p. 70).

Mr. Kennedy read a paper on the "Presence of Nicotine in Cannabis," in answer to Query 97 (see page 119), and Mr. H. C. C. Maisch one,

entitled "On the Determination of Melting Points," in answer to Query 2 (see page 52).

MR. ELIEL.—I would like to ask how Mr. Maisch arrives at the proper melting point of petroleum?

MR. MAISCH.—From the different methods used for fats.

MR. ELIEL.—The reason why I asked the question is that I tried to get at it some years ago, but I could find nothing published that was satisfactory. I found a little device for testing petrolatum very satisfactory, and have used it also on fats with very satisfactory results. It is the so-called electric test, and I ask Mr. Hallberg to explain the device.

MR. HALLBERG.—I think that Mr. Eliel can describe it better than I can, as he is more familiar with the details of this very ingenious arrangement than I am. I think that the Association would be pleased to hear from him in detail as to the manner in which the test is applied.

MR. ELIEL.—I took a narrow small piece of brass tubing and closed it at both ends; in the top I fused a copper wire, and also in the bottom, having the ends of the wires very close together. (Sketch shown.) Into this tube, I placed in the bottom a small amount of water, then the petrolatum, and on the top of the petrolatum some mercury, gauging the amount of mercury, so that it would form a connection between the two wires, which were connected with an electric alarm. This was placed in a water bath, a thermometer kept alongside of it, and heat was applied. At the moment the melting point was reached the mercury dropped, sounded the alarm, and all I had to do was to examine the thermometer. I found by different experiments, made under different conditions, that the variations seldom exceeded more than one-tenth of a degree, when experimenting upon the same preparation.

THE SECRETARY.—Will not the mercury drop through the petrolatum before this is melted?

MR. ELIEL.—It will not.

THE SECRETARY.—What keeps it up?

MR. ELIEL.—The small amount of space.

THE SECRETARY.—The tube is capillary?

MR. ELIEL.—Yes, sir.

Vice-President Menninger occupied the chair.

A paper by Mr. J. M. Good, "On the Purity of Medicinal Substances," in answer to Query 89, was read by title and referred (see page 34). The same course was taken with a paper on "Commercial Balsam of Peru."*

Mr. G. C. Close read a paper on "Glyconin and its Uses," which was accepted and referred (see p. 47). The same course was ordered for a volunteer paper entitled, "Analysis of the Underground Portion of Phlox Carolina," read by its author, Mr. Trimble (see page 115).

A paper on "The Quality of Belladonna Leaves," by Mr. A. B. Lyons, in answer to Query 103, was read by title and referred (see page 110).

* The paper was not received by the Secretary. Requests for it under date of October 20th and 25th, met with no response.—SECRETARY.

Mr. Remington read Mr. Lemberger's paper on "Concentrated Liquid Preparations for Dilution," in reply to Query 100 (see page 50.)

MR. REMINGTON.—In my judgment it is perfectly proper to use concentrated preparations under certain circumstances, such as Mr. Lemberger mentions in case of nuxvomica and aconite where we have an alcoholic fluid extract. There cannot be any objection to diluting with alcohol to the proper strength of the tincture. But if an alcoholic fluid extract is to be used for making a hydro-alcoholic tincture, you must be governed by circumstances in the addition of the alcoholic menstruum, which would cause precipitation in some cases. The fluid extract of ginger may be diluted with alcohol to obtain the tincture, but if it were to be diluted with diluted alcohol you would have a precipitation of the resin. Therefore I think that it is not proper to establish the habit of indiscriminately diluting the concentrated preparations to make the weaker ones; it can only be done safely where the menstruum used to dilute is exactly the same as the one used in making the concentrated preparations.

A volunteer paper by Mr. H. W. Snow, on the "Assay of Guarana and its Fluid Extract" was presented, read by title, accepted and referred. (See page 107.)

Mr. Remington commenced reading a paper entitled "Notes to a few of the Queries," but finding two pages of the manuscript, missing it was referred to be completed by the author. (See page 55.)*

Mr. Remington read a paper by Mr. Emil Scheffer, on "Butter and its Substitutes," which was accepted and referred.

MR. TRIMBLE.—I think stearin is not used to replace the butter so much as the oil pressed from it; but we are getting a reliable series of tests by solubility that should be taken account of. The oil is known in commerce as "Oleo oil," and may have a different solubility from the stearin which Mr. Scheffer used. I think that the most reliable test is the one in which butyric acid is estimated; and it requires a quantitative determination to detect adulteration.

PROFESSOR REMINGTON.—Butyric ether?

MR. TRIMBLE.—Butyric ether would do well for qualitative determination, but it would not answer for a quantitative determination; those samples which are offered in the market are usually mixtures with butter, because this oil is churned with fresh milk and contains a certain amount of good butter.

MR. CLOSE.—They do not want the stearin; they keep that out as far as they can to make it into candles; it has to be very pure.

Mr. Day read a paper on "Evaporation of Percolates," by J. U. Lloyd (see page 38). A number of samples were shown in illustration of the subject discussed in the paper, which was accepted and referred.

Mr. Todd read a paper, discussing the cultivation of Peppermint and the production of Oil of Peppermint. On motion of Mr. Remington, the paper was accepted (see page 121) with the thanks of the Association.

The hour of five having arrived, the fifth session was closed.

* Dr. Cummings had sent his paper to a journal—not to the Committee on Papers—without retaining a copy of it. He re-wrote the paper, which was received October 9, in time to be inserted on page 55.—SECRETARY.

SIXTH SESSION.—THURSDAY EVENING, SEPTEMBER 9.

Shortly after the adjournment of the fifth session, President Tufts called the meeting to order, when on motion of Mr. Colcord, it was resolved that during the present session debates be limited to three minutes, and that no member be allowed to speak twice on the same subject, except by the unanimous consent of the Association.

Mr. George W. Voss, of Cincinnati, having been proposed by the nominating committee for Local Secretary for the ensuing year, Mr. Sheppard moved that the Secretary deposit an affirmative ballot for the nominee, which was agreed to, and Mr. Voss declared duly elected.

Mr. Kennedy reported the applications of two candidates for membership, which had been examined at the third session of Council.

Mr. Remington, as Chairman of the Committee on Management, reported progress, and since the work of re-organizing the order of business required considerable labor, reported the continuance of the committee, with the view of making a full report at the next annual meeting, which, on motion, was agreed to.

On motion of Mr. Sheppard, the Local Secretary for the coming year was appointed chairman of the Committee on Arrangements, with authority to appoint four additional members of the committee.* Afterwards, by special vote of the Association, Messrs. T. J. Macmahan, of New York, and W. H. Rogers, of Middletown, N. Y., were added to the Arrangement Committee.

The Secretary read the following report :

This Association has heard that several of its members in Charleston have suffered severe loss from the recent calamity by earthquake ; therefore be it

Resolved, That the members of the American Pharmaceutical Association now in session assembled at Providence, R. I., do extend their hearty sympathy for them, and trust they may speedily be able to resume their business, and that their losses may be made good to them by increased prosperity.

P W. BEDFORD,
GEO. McDONALD,
G. F. H. MARKOE.

On motion of Mr. Sheppard, the report was accepted, and it was resolved that it be spread on the minutes, and that in reply to a telegram from one of our ex-Presidents, a copy of the report with resolution be sent by the President to Mr. Gustavus J. Luhn, Charleston, S. C., extending our sympathy personally to the sufferers in his city.

Mr. Seabury offered as an amendment that \$100 out of the reserve fund be appropriated for the sufferers in the Charleston disaster. The motion was shown to conflict with Article IV of the Constitution, and it was stated that a contribution should come from private sources. The motion was then withdrawn.

* Mr. G. W. Voss has accepted the office of Local Secretary for the coming year, and appointed Messrs. J. D. Wells, Geo. Merrell, C. P. Rendigs and C. T. Fennell, of Cincinnati, members of the Arrangement Committee.—SECRETARY.

Mr. Remington presented the following resolutions, which were adopted :

Resolved, That the thanks of this Association are due, and are hereby tendered to the Committee of Arrangements and their co-laborers, who have been untiring in their efforts to make this meeting successful.

Resolved, That our thanks are due, and that they be tendered to the Governor of this State, the Mayor of this city, and the citizens generally, for the cordial welcome that they have extended to us.

Resolved, That any papers which have been presented, but which have not been read, be referred to the Committee on Publication.

Resolved, That our thanks are tendered to the press of the city of Providence for the full and careful reports of our proceedings that they have daily published.

Mr. Day stated that the Association being pressed for time, he did not wish now to call up the amendment to Chapter VIII, Article III, of the By-laws, and asked whether it could be considered at the first session of the next meeting. After some discussion, the amendment was laid on the table, on a motion by Mr. Macmahan.

Vice-President Alexander in the chair.

The Nominating Committee presented the name of Mr. Alfred H. Mason, of Montreal, as Chairman of the Committee on Drug Market. On motion of Mr. De Forest, the Secretary was instructed to deposit an affirmative ballot, and Mr. Mason was elected.

Mr. Colcord called up the amendment offered by him to Chapter VIII, Article IV. On taking the question, 11 votes were cast in the affirmative, the negative votes being so numerous, that without counting them the chair declared the amendment lost.

Mr. Thompson moved that the introductory portion of the report on the Progress of Pharmacy, being momentarily inaccessible, be referred for publication without regarding it. This was agreed to.

On motion of Mr. Markoe, the Arrangement Committee was specially requested to secure a quiet hall for the meeting in Cincinnati.

MR. MASON.—When I had the privilege day before yesterday of being admitted to this Association as a delegate from the British Pharmaceutical Conference, the opportunity was not accorded me to thank you for the honor conferred upon me by the Association. Although it happened that I had the honor of being a member of this Association still I took it that I should cast that on one side and accept the hospitality which you have offered. I have much enjoyed your meeting, and shall have great pleasure in reporting to the Conference in England the kind reception which you have accorded me on their behalf.

The minutes of the fifth and sixth sessions having been read by the Secretary and approved, Mr. Thompson moved that the Association now adjourn, to meet in the city of Cincinnati, on Monday, September 5, 1887, at two o'clock p. m. The question being taken, the President declared the Association adjourned.

At the fourth and fifth sessions of Council held after the adjournment of the Association (six members present at the former and eight members at the latter session), the following business came up:

The three candidates for membership reported to the Association at the fourth and sixth sessions were duly elected: Walter A. Walling, Providence, R. I.; Arthur Wellesley Wellington, Providence; Goodwin R. Wiley, Bethel, Me.

The salary of the Reporter on Progress of Pharmacy for ensuing year was fixed at \$750.

An appropriation, not to exceed \$100, to be charged against the Centennial Fund, was made for the use of the Committee on Unofficial Formulas in the prosecution of their labors.

JOHN M. MAISCH, *Permanent Secretary*.

The second week of September had brought unexpectedly warm weather, which however was relieved in Providence by refreshing breezes from the bay. The headquarters were in the Narragansett Hotel.

On Tuesday evening the Rhode Island Pharmaceutical Association tendered to the visitors a reception at Blackstone Hall, where speeches were made by Congressman H. J. Spooner, Mayor Robbins, and City Solicitor Van Slyck, these being followed by dancing, with an intermission near midnight to partake of refreshments.

On Wednesday and Thursday the ladies were taken to Roger Williams Park, Pawtucket, and other places of interest. The Opera House was visited on Wednesday evening to see Frederick Warde in "Virginius," and on Thursday evening an enjoyable entertainment was given at Blackstone Hall, with excellent music on the piano by Mrs. Markoe, captivating recitations by Miss Jennie L. Dexter, and a very good stereopticon exhibition of American and European sceneries, and of portraits, accompanied by lucid explanations by Professor Bedford.

On Friday morning the company embarked on the steamer Bay Queen for a sail down Narragansett Bay, landing first at Crescent Park, to enjoy a Rhode Island clam-bake. Opportunity was afforded to witness the dredging and sorting of the clams, as well as the baking upon heated stones under covers of sea-weed. The repast over, resolutions of thanks to the Pawtucket Hair Cloth Company, to Mr. Metcalf, Mr. Phillips and others, were passed for courtesies extended to the visitors; Mr. Blanding was decorated with a large silver-plated spatula suitably inscribed, and Mr. Danforth was the recipient of a handsome dinner set, in recognition of the services rendered by both gentlemen for the success of the meeting.

The sail was then continued to Newport, where conveyances were in waiting to take the entire party through the most interesting portions of that famous watering place, and over the "Ten-Mile Ocean Drive" to the Life-Saving Station. Here a cold collation was provided for, and an exhibition drill of the crew of the station commanded by Captain Gould.

On returning to Providence, most of the members left for their homes, either by Sound steamer or by rail; but several parties participated in excursions to Martha's Vineyard, Nantucket and the White Mountains, the latter ascending Mount Lafayette and Mount Washington.

REPORT

OF THE

COMMITTEE ON NATIONAL FORMULARY

INTRODUCTORY.

THE collection of formulæ here presented consists of several distinct portions, all of which have, however, been blended together in one alphabetical series.

In the first place, it contains the results of the work performed during the past year (Sept. 1885—Sept. 1886) by the Committee on National Formulary.

All formulæ, which the Committee has been able to study, with the help of the critical material then in hand, are distinguished by an asterisk (*), and are subscribed with the abbreviation "N. F. C." (National Formulary Committee.) The absence of these marks, in the case of formulæ which came into their possession in seasonable time, does not imply that the unmarked ones are rejected by the Committee, but simply indicates that they have not been sufficiently examined for want of time.

The Committee, of course, was bound to accept all formulæ presented to it in time for their report, but many of these had to be left in their original shape for the present, though they may not harmonize with others belonging to the same class. It will be noticed that there is a surfeit of certain kinds of preparations differing but little in their medicinal constituents or therapeutic properties, (for instance, elixirs containing some ferruginous salt, with cinchona or its alkaloids). While the Committee, temporarily, fixed upon *one* among several available formulæ, as being, in their judgment, the most eligible, yet all the others are presented at the same time, as it is not certain that the best formula has been preferred in each case. It is to be hoped that out of the multiplicity of formulæ reported to be in use in different sections of the country—not a few of which are clearly affected by the fault of poly-

pharmacy—there may finally emerge a limited number of reliable, stable, and generally satisfactory, standard preparations.

The collection contains, besides, a number of formulæ which came into the possession of the Committee too late to receive its attention. Most of these are derived from the Pennsylvania Formulary.

The new Committee, as reconstructed by a resolution adopted at the meeting held at Providence (Sept. 7-9, 1886), consists of the *five* members subscribed to this report, and of *one* representative from *each* State Pharmaceutical Association, to be appointed by the President of the Amer. Pharm. Assoc. These latter may be called, for brevity's sake, *non-resident members*, and they are requested to attend the meetings of the Committee, which will be held, until further notice, every Friday (holidays excepted) at 3 p. m., at the College of Pharmacy of the City of New York (209-211 East 23d St.) Five members form a quorum.

It will be the especial duty of the non-resident members to ascertain, in any manner that may best accomplish the purpose, the views of the members of the profession in their respective States, regarding the scope and contents of the proposed Formulary, also to contribute the titles and working formulæ of any preparations which they deem worthy of incorporation in the work, and particularly to assist in rendering those contained in the present draft, which may be found worthy of survival, practical and correct. They are also urged to enlist the coöperation of the medical profession in forwarding the object for which the National Formulary is proposed to be established. Those non-resident members who are unable to attend the meetings of the Committee in person, will be informed from time to time of the progress of the work. All of them are most urgently requested *to begin work immediately after their appointment*, so that all the necessary preliminary work may be completed on or before July 1, 1887.

Contributions and criticisms are also solicited from members of the profession outside of the Committee, or from those located in States where no representative or member of the Committee resides.

The Committee should not be held responsible for any contributions received after the date above mentioned (July 1, 1887), as the remaining time, previous to the next annual meeting, will be required for the elaboration of the final text from the materials then in hand.

Special attention is called to certain resolutions of the Amer. Pharm. Assoc., based upon recommendations made by the Committee. One of these refers to the *Scope of the Formulary*. Accordingly, any preparation not contained in the U. S. Ph., which is legitimately used in pharmacy, and not of a purely technical or trivial character, may be introduced into it. Regarding *Weights and Measures*, it was determined that apothecaries' weights and U. S. measures should be employed, at least in all liquid preparations which are prescribed and administered by measure.

Further, the Committee was authorized, in all cases where deemed necessary, to call upon the proposer of a formula for a specimen of the preparation as made by himself after the process recommended. And the Committee is to be held blameless for modifying or ignoring formulæ, samples of which have not been furnished, when so requested.*

CHARLES RICE,
WILLIAM P. DEFOREST,
P. W. BEDFORD,
SAMUEL J. BENDINER,
ADOLPH 'TSCHEPPE,

Committee on National Formulary.

NOTICE.

All *communications* and *contributions* addressed to the Committee (at "College of Pharmacy," 209-211 East Twenty-third street, New York) are desired to be written on *one* side of the paper only, so that they may be inserted or pasted into the corresponding places of the manuscript without having to be copied.

It is also requested that copies of any *journal, pamphlet, or other publication*, containing criticisms of, or contributions to the Formulary, be promptly forwarded to the Committee.

EXPLANATION OF ABBREVIATIONS, ETC.

* — The asterisk is used to distinguish those formulæ which have been studied by the Committee. Most of these are subscribed with the abbreviation "(N. F. C.)." Where the latter is omitted, it implies that the Committee accepted the formula only temporarily, without being responsible for its correctness.

D. C. = The Joint Committee on Formulary of the District of Columbia.

N. F. C. — The Committee on National Formulary of the Amer. Pharm. Assoc. When the adopted formula has been contributed to this Committee by other pharmaceutical bodies, due credit has been given. It has been found impractical to give credit to individual contributors.

N. Y. & B. = The New York and Brooklyn Formulary. As the text of this has been printed in full in the *Proceedings* for 1885 (pp. 583-612), and separate copies of it are widely distributed, the directions appended to the several formulæ have been reprinted only in case some change has been made.

* The passages referring to the *new* Committee, as reconstructed at the Providence Meeting, have been inserted here in accordance with a resolution adopted at a meeting of the five members subscribed to the present report, at which a temporary organization of the new Committee was effected. As this report is to be distributed among those who propose, or are expected to assist in its revision, it has been deemed advisable, at the risk of committing an anachronism, provisionally to outline the general plan of the work to be performed, in the hope that it will be approved and endorsed when the Committee is completed and regularly constituted.

Pa. = The Formulary of the Pennsylvania Pharm. Association.

The Formulary Committees of other States, which have furnished contributions, are indicated by the abbreviated names of the several States (for instance, *Ill.*, *Ky.*, *Wis.*, etc.),

When the title of a preparation is given with the remark "Formula wanted," this means the formula in use in the locality from which the request of its introduction has been received. The N. F. C. may be in possession of formulæ for such preparations, but not being personally familiar with the preferences of other localities, it must rely upon definite instructions in such cases.

In some cases the title of a preparation contained in other formularies has been altered to bring it in its proper place, for the sake of comparison. For instance, *Mistura Phosphatica* was changed to *Emulsio Phosphatica*.

A

PRELIMINARY DRAFT

OF A

NATIONAL FORMULARY

OF

UNOFFICIAL PREPARATIONS.

1. Acetum Aromaticum.*—Aromatic Vinegar.

Oils of Lavender, Rosemary, Juniper, Peppermint, Cinnamon, each 4 min., Oils of Lemon, Cloves, each 8 min., Alcohol 3 fl.oz., Acetic Acid 4 fl.oz., Water enough to make 16 fl.oz.

Dissolve the Oils in the Alcohol, add the Acetic Acid, and lastly, enough Water to make 16 fl.oz. Set the turbid mixture aside for a few days, occasionally agitating, and filter. (*N. F. C.*)

2. Acidum Carbolicum Camphoratum.*—Camphorated Carbolic Acid.—Camphora Carbolisata; Phenol Camphoratum.

Camphor, in coarse powder, 100 p., Carbolic Acid 36 p., Alcohol 4 p.

Mix them so that a clear, oily liquid may be produced. (*N. F. C.*)

3. Acidum Carbolicum Iodatum.*—Iodized Carbolic Acid.—Phenol Iodatum, Iodized Phenol.

Iodine 1 p., Carbolic Acid 4 p.

Rub the Iodine to powder in a glass mortar, and introduce it into a flask. Then rinse the mortar with the Carbolic Acid, previously liquefied by a gentle heat and mixed with 5 per cent. of glycerin; transfer this to the flask and digest the mixture at a very gentle heat, frequently agitating, until the Iodine is dissolved.

Keep the product in glass-stoppered vials, in a dark place. (*N. F. C.*)

4. Acidum Phosphoricum Glaciale Dilutum.*—*Diluted Glacial Phosphoric Acid.*

Glacial Phosphoric Acid 1 tr.oz., Water enough to make 10 fl.oz.

Dissolve the Acid in the Water.

This preparation should not be prepared in quantities larger than may be consumed within a few months. (*N. F. C.*)

Note.—Whenever Pyrophosphate of Iron (U. S. Ph.) is to be combined in a mixture with Diluted Phosphoric Acid, the officinal tribasic acid is inadmissible, as it produces with the salt a gelatinous precipitate. In place of the officinal, the above preparation is to be used. The same may be done when Phosphate of Iron (U. S. Ph.) is prescribed, though the precipitate in this case is not as bulky, and under certain circumstances may not form at all. At the same time, however, it should be remembered that the glacial acid is, itself, incompatible with certain other substances. Assuming the average quantity of impurities (phosphate of sodium, etc.), present in commercial glacial phosphoric acid, as 10 per cent., and regarding the acid as metaphosphoric, the above given proportions will produce a diluted acid containing about 10 per cent. of HPO_3 .

5. Aqua Chloroformi.*—*Chloroform Water.*

Purified Chloroform 30 min., Distilled Water 10 fl.oz.

Shake them together, in a bottle of twice the volume, until the Chloroform is dissolved, or only a minute quantity remains, which cannot be dissolved on further agitation. Filter the solution through purified cotton.

Note.—Chloroform water may be used as a preservative agent, and forms a good menstruum, in place of water, for preparing solutions intended to be kept free from micro-organisms. (*N. F. C.*)

6. Aqua Sedativa.*—*Sedative Water.*—Eau Sédative (Raspail).

Stronger Water of Ammonia 350 min., Spirit of Camphor 90 min., Chloride of Sodium 440 gr., Distilled Water enough to make 16 fl.oz.

Dissolve and mix. Shake the liquid when it is to be dispensed. (*N. F. C.* from *Codex.*)

7. Balsamum Traumaticum.*—*Turlington's Balsam.*—Friar's Balsam.

Benzoin, in coarse pd., 3 tr.oz., Storax 1 tr.oz., Aloes, in coarse pd., Myrrh, in coarse pd., each 120 gr., Angelica Root 60 gr., Balsam of Peru 256 gr., Balsam of Tolu, Extract of Glycyrrhiza, pd., each 1 tr.oz., Alcohol 32 fl.oz.

Macerate the substances with the Alcohol during ten days; then filter.

Note.—The officinal *Tinctura Benzoini Composita* is a simplified preparation intended as a substitute for the above. (*N. F. C.*)

8. Carbasus Antiseptica.*—*Antiseptic Gauze.*—Carbolized Gauze.

Resin, in coarse pd., 40 tr.oz., Castor Oil 5 fl.oz., Carbolic Acid 10 tr.oz., Alcohol 220 fl.oz., Gauze-muslin q. s.

Dissolve the Resin, Castor Oil and Carbolic Acid in the Alcohol. Then immerse in the mixture folded pieces of the gauze-muslin, and allow them to macerate for about 15 minutes, or until they are thoroughly saturated. Remove the excess of liquid by strong pressure, spread the

pieces out horizontally, and as soon as the Alcohol has nearly all evaporated, fold and wrap them up in paraffin paper, and preserve them in air-tight boxes.

Note.—The most suitable brand of muslin for making antiseptic gauze, is that known as “Lehigh E.” (*N. F. C.*)

9. Ceratum Camphoræ Compositum.*—*Compound Camphor Cerate.*—Ceratum Camphoratum. Camphor Ice.

Camphor 3 p., Benzoinated Lard 15 p., White Wax 10 p., Spermaceti 4 p., Alcohol q. s.

Triturate the Camphor with a sufficient quantity of Alcohol to dissolve it. Then, having melted the White Wax and Spermaceti on a water-bath, gradually add the solution of Camphor, and continue stirring until the Alcohol has evaporated. Then withdraw the heat, and having stirred the mixture occasionally until it has somewhat cooled, mix it, while still liquid, intimately with the Benzoinated Lard (which should have been prepared from purified and washed lard) and pour it into suitable moulds. (*N. F. C.*)

10. Chloral Camphoratum.*—*Chloral and Camphor.*

Chloral 1 p., Camphor 1 p.

Triturate them together until they are thoroughly liquefied and combined. (*N. F. C.*)

11. Collodium Iodatum.*—*Iodized Collodion.*

Iodine 30 gr., Collodion 1 fl.oz.

Introduce the Iodine into a bottle, add the Collodion, and dissolve by agitation. (*N. F. C.*)

12. Collodium Tiglii*.—*Croton Oil Collodion.*

Croton Oil 60 min., Flexible Collodion 7 fl.dr.

Mix them. (*N. F. C.*)

13. Collodium Salicylatum.*—*Salicylated Collodion.*—Corn Remedy.

Salicylic Acid 30 gr., Extract of Indian Cannabis 5 gr., Collodion 240 gr., Alcohol q. s.

Dissolve the Extract of Indian Hemp in a few drops of Alcohol, then add the solution to the Collodion, in which the acid had previously been dissolved. (*N. F. C.*)

14. Cordiale Rubi.*—*Blackberry Cordial.*—Blackberry Brandy.

I.* Brandy 2 pints, Blackberry Juice, Syrup, each 3 pints, Cinnamon 2 av. oz., Cloves, Nutmeg, each $\frac{1}{2}$ av. oz.

Digest the Brandy with the spices for 8 days, mix with the Blackberry Juice and strain, then add the syrup. (*N. F. C.*)

II. Galls, Blackberry Root, Cinnamon, each 2 av.oz., Cloves $\frac{1}{2}$ av.oz., Mace, Gin-

ger, each $\frac{1}{4}$ av.oz., Brandy 2 pints, Simple Syrup, Blackberry Juice, recently expressed, each 3 pints.

Reduce the drugs to a coarse powder and macerate in the Brandy for one week, express, and filter, then add the Blackberry Juice and Syrup. (*Pa.*)

Note.—This preparation is entitled by the *Pa.* “Elixir Rubi Aromaticum; Blackberry Cordial.”

15. Decoctum Aloes Compositum.*—Compound Decoction of Aloes.

Extract of Socotrine Aloes 120 gr., Myrrh, Saffron, each 90 gr., Carbonate of Potassium 60 gr., Extract of Liquorice 435 gr., Compound Tincture of Cardamom 8 fl.oz., Distilled Water enough to make 30 fl.oz.

Reduce the Myrrh and Extract of Aloes to a coarse powder, mix them together with the Carbonate of Potassium and Extract of Liquorice in a suitable covered vessel, and pour on 20 fl.oz. of Distilled Water, boil for five (5) minutes, then add the Saffron. When cool, add the Tincture of Cardamom, and allow to macerate for 2 hours, then strain through flannel, and make the product measure 30 fl.oz. (*N. F. C.*, after *Brit. Pharm.*)

16. Elixir Acidi Salicylici.*—Elixir of Salicylic Acid.

Salicylic Acid 640 gr., Citrate of Potassium 2 tr.oz., Glycerin 8 fl.oz., Aromatic Elixir enough to make 16 fl.oz.

Dissolve the Citrate of Potassium in the Glycerin with the aid of a gentle heat. Add the Salicylic Acid, and continue the heat until it is dissolved. Then add enough Aromatic Elixir to make the product measure 16 fl.oz. (*N. F. C.*)

17. Elixir Adjuvans.*—Adjuvant Elixir.

Sweet Orange Peel 2 tr.oz., Coriander, Caraway, each 1 tr.oz., Wild Cherry 4 tr.oz., Glycyrrhiza, Russian, peeled, 10 tr. oz., Alcohol, Water, each a sufficient quantity, Syrup enough to make 1 gall. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—The *Pa.* adopts the *N. Y. & B.* formula unaltered. The *Ill. Comm.* recommended the increase of Glycyrrhiza from $6\frac{1}{2}$ to 10 oz.

18. Elixir Aloini et Strychninæ.—Elixir of Aloin and Strychnine.

Aloin 32 gr., Solution of Strychnine 128 min., Aromatic Elixir (*Pa.*) q. s. to make 1 pint

Dissolve the Aloin in 8 oz. of the Elixir and add the Solution of Strychnine; shake well and add enough Elixir to make the whole measure *one pint*.

Each fl.dr. contains $\frac{1}{4}$ gr. of Aloin and $\frac{1}{80}$ gr. of Strychnine. (*Pa.*)

19. Elixir Aloini, Strychninæ et Belladonnæ.—Elixir of Aloin, Strychnine and Belladonna.

Fluid Extract of Belladonna 64 min., Elixir of Aloin and Strychnine enough to make 1 pint. (*Pa.*)

20. Elixir Ammonii Bromidi.*—Elixir of Bromide of Ammonium.

Bromide of Ammonium 640 gr., Citric Acid 30 gr., Adjuvant Elixir enough to make 16 fl.oz. Dissolve and filter. (*N. Y. and B.*, revised. *N. F. C.*)

Note.—The *Pa.* recommends Comp. Elixir of Taraxacum in place of Adjuvant Elixir. The *D. C.* uses the “Elixir Aurantii” of the U. S. Ph.

All Elixirs containing Bromides or Hypophosphites of the alkalies or alkaline earths should have 30 gr. of Citric Acid added to each pint, as this greatly improves their taste.

21. Elixir Ammonii et Quininæ Valerianatum.*—Elixir of Valerianate of Ammonium and Quinine.

Valerianate of Quinine 64 gr., Elixir of Valerianate of Ammonium 16 fl.oz.

Triturate the Valerianate of Quinine to a fine powder, dissolve it in the Elixir, and filter. (*N. F. C.* from *Ky.*)

Note.—The *Pa.* has an “Elixir Amm. Valer. et Quininæ,” made by dissolving 128 gr. of Sulphate of Quinine in 1 pint of Elix. of Valer. of Ammonium.

22. Elixir Ammonii, Quininæ et Strychninæ Valerianatum.—Elixir of Valerianate of Ammonium, Quinine, and Strychnine.

Strychnine $2\frac{1}{2}$ gr., Valerianic Acid q. s., Valerianate of Quinine 64 gr., Tincture of Cudbear 2 fl.dr., Elixir of Valerianate of Ammonium 16 fl.oz.

Dissolve the Strychnine in 2 fl.dr. of the Elixir by the aid of just enough Valerianic Acid. Triturate the Valerianate of Quinine with the solution, and finally add the Tincture of Cudbear, and enough of the Elixir to make 16 fl.oz. When solution has been effected, filter. (*Ky.*)

Note.—See remarks to Elix. Quininæ Valerianatis.

23. Elixir Ammonii Valerianatis.*—Elixir of Valerianate of Ammonium.

I.* Valerianate of Ammonium 256 gr., Chloroform 6 min., Tincture of Vanilla 2 fl.dr., Water of Ammonium a sufficient quantity, Tincture of Cudbear 2 fl.dr., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Valerianate of Ammonium 256 gr., Water 1 fl.oz., Elixir of Orange (U. S.) 15 fl.oz., Water of Ammonia q. s. (*D. C.*)

24. Elixir Anisi.*—Elixir of Anise.—Aniseed Cordial.

Oil of Anise (Saxony) 25 min., Oil of Fennel Seed (“sweet”) 5 min., Oil of Bitter Almond 1 drop, Deodorized Alcohol 4 fl.oz., Syrup 10 fl.oz., Water 2 fl.oz., Phosphate of Calcium 120 gr.

Mix the Oils with the Deodorized Alcohol, add the Syrup and Water, and set aside for twelve hours. Then mix the Elixir intimately with the Phosphate of Calcium. Set it aside for a few hours in a cold place, and filter it while cold through a well-wetted filter, returning the first portions of the filtrate until it runs through clear.

Note.—Oil of Staranise, which is usually supplied by dealers when “Oil of Anise” without further specification is ordered, does not answer well for the above cordial. Russian Oil of Anise may be used, but the Saxony oil furnishes the finest product. (*N. Y. & B.*, revised. *N. F. C.*)

Additional Note.—The *Pa.* and the *Wis. Comm.* recommend powdered Talcum in place of Phosphate of Calcium, as an aid in clarifying and filtering.

25. Elixir Apii Compositum.*—*Compound Elixir of Celery.*

Fluid Extract of Celery (Root), Fluid Extract of Erythroxylon, Fluid Extract of Viburnum Prunifolium, each 1 fl.oz., Alcohol 2 fl.oz., Sugar 4 tr.oz., Spirit of Orange 2 fl.dr., Water enough to make 16 fl.oz.

Add the Spirit of Orange to the Alcohol, and to this add 1 fl.oz. of Water. Mix this gradually with the Fluid Extract of Celery, and then add the other Fluid Extracts. Pour this mixture into the Syrup obtained by dissolving the Sugar in the remainder of the Water, and mix thoroughly. Let stand two days and filter, adding Water, if necessary, to make up the measure. (*N. F. C.* from *III.*)

26. Elixir Aromaticum.*—*Aromatic Elixir.*

I.* Aromatic Spirit 16 fl.oz., Syrup, Water, each 24 fl.oz., Phosphate of Calcium 1 oz.

Mix the liquids, adding the Water last. Then mix thoroughly with the Phosphate of Calcium, and filter through a well-wetted filter, returning the first portions of the filtrate until it runs through clear.

Note.—The spec grav. of Aromatic Elixir is 1.100. If it is desired to impart to this Elixir a red color, this may be effected by the addition of 2 fl. dr. of Tincture of Cudbear to each pint.

This Elixir should not be mixed with preparations containing iron, unless the aromatic spirit contained in it is prepared from the essential oils. See *Spiritus Aromaticus*.

The title "Elixir Simplex," "Simple Elixir," has been changed to avoid confusion with the officinal Simple Elixir (*Elixir Aurantii*). (*N. Y. & B.*, revised. *N. F. C.*)

II. Solution of Oil of Orange (see *Spiritus Aurantii*) 10 fl.dr., Sol. of Oil Cinnamon 100 min., Sol. of Oil Anise 40 min., Sol of Oil Bitter Almond 20 min., Tinct. Cardamom 10 fl.dr., Alcohol 2 pints, Sugar 3 lbs., Cocoa (Baker's) 1 tr.oz., Carb. Magnesium 2 tr.oz.

Mix all the liquids, and triturate with the two last-named ingredients previously powdered together. Then add gradually 4½ pints of Water, transfer the mixture to a one-gall. bottle, agitate occasionally for several hours and filter. Express the filter between muslin, filter the expressed liquid, mix with the previous filtrate, and dissolve in it the Sugar. Filter or strain as may be necessary. (*Ky.*)

III. Oil of Orange 4 fl.dr., Alcohol 6 pints, Talcum 2 av. oz., Orange Flower Water 4 pints, Syrup 4 pints.

Mix together in the order named, shake well and filter. (*Pa.*)

IV. Tincture of Fresh Orange Peel 3 fl.oz., Tinct. of Fresh Lemon Peel 1 fl.oz., Alcohol 2 fl.oz., Talcum ½ av.oz., Orange Flower Water 2 fl.oz., Syrup enough to make 1 pint.

Mix and filter. (*Pa.*)

Note.—The preceding two formulæ (II and III) are given by the *Pa.*, under the title "Elixir Aurantii," "Elixir of Orange."

V. "*Elixir Aromaticum*. Elixir Gari. Aromatic Elixir." Cinnamon, Cassia, Cloves, Nutmeg, each 2 dr., Myrrh 1 av.oz., Aloes 2 av.oz., Alcohol 2 quarts, Water 1 quart, Spanish Saffron 30 grs., Orange Flower Water 4 fl.oz.

Reduce the drugs (except the Saffron) to a moderately coarse powder, mix one-half of the Alcohol with the Water, and place all into a small still. After macerating for 24 hours, distil off 1 quart, and add to this the Saffron, the remaining quart of Alcohol, and the Orange Flower Water. As soon as the Saffron is exhausted, filter and add Syrup 2 quarts. Product: 1 gall. (*Pa.*)

Note.—This preparation, which is used as a stomachic, has been entitled “Elixir Aromaticum” by the *Pa.* If it is retained, a change of titles will be necessary.

27. Elixir Aurantii.—*Elixir of Orange.*

See *Elixir Aromaticum*, III and IV.

28. Elixir Aurantii Compositum.*—*Compound Elixir of Orange.*—Elixir Aurantium Compositum.

Bitter Orange Peel 1600 gr., Cinnamon, bruised, 320 gr., Carbonate of Potassium 80 gr., Extract of Gentian, Extract of Wormwood, Extract of Buckbean (*Menyanthes trifoliata*), Extract of Cascarella, each 160 gr., Sherry Wine enough to make 16 fl.oz.

Macerate the Orange Peel, Cinnamon, and Carbonate of Potassium with 16 fl.oz. of Sherry Wine during 8 days, and express the liquid portion. Dissolve in this the several extracts, filter, and add enough Sherry Wine through the filter, to make the product measure 16 fl.oz. (*N. F. C.* after *Pharm. Germ.*)

29. Elixir Bismuthi.*—*Elixir of Bismuth.*

I.* Citrate of Bismuth and Ammonium 256 gr., Water 1 fl.oz., Water of Ammonia, a sufficient quantity, Aromatic Elixir enough to make 16 fl.oz.

Dissolve the Citrate of Bismuth and Ammonium in the Water, allow the solution to stand until clear, if necessary; decant the clear liquid and add to the residue just enough Water of Ammonia to dissolve it. Then mix it with the decanted portion and add enough Aromatic Elixir to make 16 fl.oz.

Each fl.dr. contains 2 gr. of Citrate of Bismuth and Ammonium. (*N. Y. and B.*, revised. *N. F. C.*)

Note.—The *Pa.* adopts the formula of the *N. Y. and B.*, using “Elixir of Orange.”

II. “A white precipitate takes place in this elixir upon standing. The present formula may be improved by using the ammonio-citrate of bismuth prepared according to the process of Méhu, as modified by Macewan. (See *Western Druggist*, 1886, pg. 87.)” (*Ill.*) See also *American Druggist*, 1886, pg. 66.

30. Elixir Buchu.*—*Elixir of Buchu.*

I.* Fluid Extract of Buchu 2 fl.oz., Fluid Extract of Triticum 1 fl.oz., Tincture of Vanilla 1 fl.dr., Syrup of Coffee 6 fl.oz., Carbonate of Magnesium 120 gr., Aromatic Elixir enough to make 16 fluidounces. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Buchu 4 fl.oz., Talcum 1 oz., Compound Elixir of Taraxacum to make 1 pint.

Triturate the Fluid Extract of Buchu with the Talcum and gradually

add 12 fl.oz. of the Elixir, and filter, then add enough Elixir to measure *one pint*. (Pa.)

31. Elixir Buchu Compositum.*—Compound Elixir of Buchu.

I.* Compound Fluid Extract of Buchu, Aromatic Elixir, each 2 fl. oz., Compound Elixir of Taraxacum 12 fl.oz., Carbonate of Magnesium 120 gr. (N. Y. & B., unaltered. N. F. C.)

II. Fluid Extract of Buchu 2 fl.oz., Fluid Extract of Pareira Brava, Fluid Extract of Uva Ursi, each 1 fl.oz., Talcum $\frac{1}{2}$ oz., Compound Elixir of Taraxacum to make 1 pint.

Triturate the Fluid Extract of Buchu with the Talcum, add 12 oz. of Elixir, mixing thoroughly, filter, and add the other fluid Extracts and enough Elixir to measure *one pint*. (Pa.)

32. Elixir Caffeinæ.*—Elixir of Caffeine.

I.* Caffeine 128 gr., Citric Acid 32 gr., Compound Elixir of Taraxacum 4 fl.oz., Aromatic Elixir enough to make 16 fl.oz. (N. Y. & B., unaltered. N. F. C.)

II. Caffeine 128 gr., Solution of Hydrobromic Acid, 10 per cent., 2 oz. 6 dr., Compound Elixir of Taraxacum to make 1 pint.

Triturate the Caffeine with 8 oz. of the Elixir, and add the Acid; when dissolved, add enough Elixir to make the whole measure *one pint*.

Each fl.dr. contains 1 gr. of Caffeine. (Pa.)

33. Elixir Calcii Bromidi.*—Elixir of Bromide of Calcium.

I.* Bromide of Calcium 640 gr., Citric Acid 30 gr., Adjuvant Elixir enough to make 16 fl.oz. (N. Y. & B., revised. N. F. C.)

Note.—See remarks to Elixir Ammonii Bromidi.

II. Bromide of Calcium 640 gr., Aromatic Elixir of Glycyrrhiza 1 pint.

Triturate until perfectly dissolved, and filter if necessary.

Each fl.dr. contains 5 gr. of Bromide of Calcium. (Pa.)

34. Elixir Calcii Bromo-Iodatum Compositum.*—Compound Elixir of Bromide of Calcium with Iodides.

Bromide of Calcium, Iodide of Sodium, Iodide of Potassium, Chloride of Magnesium, each 256 gr., Compound Fl. Extr. of Sarsaparilla, Compound Fl. Extr. of Stillingia, each 2 fl.oz., Aromatic Elixir 4 fl.oz., Sugar 4 tr. oz., Water, enough to make 16 fl. oz.

Dissolve the salts in the Water, add the Sugar, and to this Syrup add the Fluid Extracts previously mixed with the Aromatic Elixir. After standing two days, filter and add Water to make the product measure 16 fl.oz. (N. F. C. from Ill.)

35. Elixir Calcii Hypophosphitis.*—Elixir of Hypophosphite of Calcium.

I. Hypophosphite of Calcium 256 gr., Citric Acid 30 gr., Aromatic Elixir enough to make 16 fl.oz. (N. Y. & B., revised. N. F. C.)

Note.—See remarks to Elixir Ammonii Bromidi.

II. Hypophosphite of Calcium 256 gr., Hot Water 1 oz., Solution of Hypophosphoric Acid, 50%, 2 fl.dr., Adjuvant Elixir enough to make 1 pint.

Reduce the Hypophosphite of Calcium to a fine powder, and triturate

in a mortar with the hot water and acid, then gradually add the Elixir, and filter. (*Pa.*)

36. Elixir Calcii Iodidi.*—*Elixir of Iodide of Calcium.*

Iodide of Calcium 640 gr., Aromatic Elixir enough to make 16 fl.oz.

Dissolve the Iodide of Calcium in 12 fl.oz. of Aromatic Elixir, and add enough of the latter to make the product measure 16 fl.oz. (*N. F. C.*)

37. Elixir Calcii Lactophosphatis.*—*Elixir of Lactophosphate of Calcium.*

Lactate of Calcium 128 gr., Phosphoric Acid (U. S. Ph. 1880, 50%) 128 min., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

Note.—The *Pa.* directs its “Elixir of Orange” in place of Aromatic Elixir.

38. Elixir Calcii Phosphatis.—*Elixir of Phosphate of Calcium.*

Phosphate of Calcium 640 gr., Hydrochloric Acid, U. S. P., 5 fl.dr., Water 1 fl.oz., Tincture of Cudbear 2 fl.dr., Elixir of Orange enough to make 1 pint.

Mix the Phosphate of Lime with the Water, add the Hydrochloric Acid, and when dissolved, enough Elixir of Orange to make *one pint*, and color with the Tincture of Cudbear.

Each fl.dr. contains 5 gr. of the Phosphate of Calcium. (*Pa.*)

39. Elixir Catharticum Compositum.*—*Compound Cathartic Elixir.*

I.* Resin of Podophyllum 8 gr., Alcohol $\frac{1}{2}$ fl.oz., Fluid Extract of Leptandra 6 fl.dr., Fluid Extract of Jalap 6 fl.dr., Fluid Extract of Senna 2 fl.oz., Tartrate of Potassium and Sodium 2 av.oz., Bicarbonate of Sodium 120 gr., Syrup 2 fl.oz., Compound Elixir of Taraxacum 4 fl.oz., Elixir of Glycyrrhiza enough to make 16 fl.oz.

Dissolve the Resin of Podophyllum in the Alcohol, and add the solution to the other liquids previously mixed, and in which the Tartrate of Potassium and Sodium and the Bicarbonate of Sodium have been dissolved.

The product should not be filtered, and should be shaken up before any portion of it is dispensed.

Note.—Average dose: two fl.dr. (*N. Y. & B.*, revised. *N. F. C.*)

II. Resin of Podophyllum 8 gr., Alcohol $\frac{1}{2}$ fl.oz., Fluid Extract of Frangula, Fluid Extract of Senna, each 2 fl.oz., Tartrate of Potassium and Sodium 2 av.oz., Aromatic Elixir of Glycyrrhiza, enough to make 1 pint.

Dissolve the Resin in the Alcohol, and the Rochelle Salt in the Elixir, and mix all together.

Dose—from 1 to 2 teaspoonfuls. (*Pa.*)

40. Elixir Cerasorum.—*Elixir of Cherries.*

Ripe Sour Cherries, free from stems, 8 av.oz., Alcohol 2 fl.oz., Glycerin 1 fl.oz., Simple Syrup enough to make 1 pint.

Crush the Cherries and stones to a fine pulp, add the Alcohol and Glycerin and macerate for 8 days, press and filter and add to the filtrate enough Syrup to make the whole measure *one pint*. (*Pa.*)

41. Elixir Cerasorum cum Calcii et Sodii Hypophosphitibus.

Hypophosphite of Calcium, Hypophosphite of Sodium, each 128 gr., Elixir of Cherries enough to make 1 pint.

Reduce the Hypophosphites to a fine powder and dissolve in the Elixir. Each fl.dr. contains 1 gr. of each salt. (*Pa.*)

42. Elixir Chiratae.*—Elixir of Chirata.

Tincture of Chirata (U. S.) 4 fl.oz., Aromatic Elixir 12 fl.oz. (*N. F. C.* from *Ky.*)

43. Elixir Chloral.—Elixir of Chloral Hydrate.

Chloral Hydrate 640 gr., Elixir of Orange enough to make 1 pint.

Dissolve the Chloral in the Elixir, and filter if necessary. (*Pa.*)

44. Elixir Chloral Butylici.—Elixir of Croton Chloral Hydrate.

Croton Chloral 256 gr., Alcohol 1 fl.oz., Tincture of Cacao 2 fl.oz., Aromatic Elixir enough to make 1 pint.

Dissolve the Croton Chloral in the Alcohol, add the Tincture of Cacao and enough Elixir to make *one pint*. (*Pa.*)

45. Elixir Chloral Butylici et Quininæ.—Elixir of Croton Chloral and Quinine.

Sulphate of Quinine 128 gr., Elixir of Croton Chloral Hydrate to make 1 pint.

Reduce the Quinine to a fine powder and gradually add the Elixir, stirring constantly until dissolved. (*Pa.*)

46. Elixir Chloral et Potassii Bromidi Compositum.*—Compound Elixir of Chloral with Bromide of Potassium.

Chloral, Bromide of Potassium, each 4 tr.oz., Extract of Indian Cannabis, Extract of Hyoscyamus, each 16 gr., Water enough to make 16 fl.oz.

Dissolve the Bromide of Potassium in 8 fl.oz. of boiling Water, then add the Chloral. Add the Extracts to 4 fl.oz. of boiling Water, and when they are dissolved or uniformly distributed through the liquid, add the latter to the solution of the salts. Allow to stand two days, filter, and add Water, if necessary, to make the product measure 16 fl.oz. (*N. F. C.* from *Ill.*)

47. Elixir Chloroformi.*—Elixir of Chloroform.

Purified Chloroform 256 min., Aromatic Elixir enough to make 16 fl.oz. (*N. F. C.*)

48. Elixir Cinchonæ.*—Elixir of Cinchona.—Elixir of Cinchona Bark; Elixir of Calisaya Bark.

I.* Tincture of Cinchona (U. S. Ph. 1880) 2½ fl.oz., Aromatic Spirit 2 fl.oz., Syrup 6 fl.oz., Phosphate of Calcium 120 gr., Water enough to make 16 fl.oz.

Note.—When Elixir of Cinchona is to be combined with preparations of iron, it should be made with Detannated Tincture of Cinchona. In this case it may receive the title: *Detannated Elixir of Cinchona.* (*N. Y. & B., revised. N. F. C.*)

II. Fluid Extract of Yellow Cinchona 640 min., Tincture of Cudbear 1 fl.dr., Elixir of Orange enough to make 1 pint.

Mix, and filter if necessary. (*Pa.*)

III. Solution of Oil of Orange 1 fl.dr., Alcohol 2 fl.oz., Water 1 fl.oz., Syrup 5 fl.oz., Detannated Calisaya Liquor (*Ky.*) 8 fl.oz.

Mix and filter. (*Ky.*)

IV. Detannated Tincture of Cinchona (*Ill.*) 2½ fl.oz., Aromatic Spirit 2 fl.oz., Syrup 6 fl.oz., Phosphate Calcium 120 gr., Water enough to make 16 fl.oz.

Mix the alcoholic solutions and add them gradually to the Syrup first mixed with about 6 fl.oz. of Water. Filter by the aid of the Calcium Phosphate. (*Ill.*)

Note.—The *Ill.* remark to this: This Elixir contains nearly 5 gr. of Calisaya bark to the fl.dr., and it is believed that this strength is the only kind of an Elixir of Calisaya which will meet with professional favor, or replace the commercial brands. All other Elixirs of Cinchona may be made likewise with the Detannated Tincture.

49. Elixir Cinchonæ, Carnis et Ferri.—*Elixir of Cinchona (Calisaya) with Iron and Beef.*

Extract of Beef (ppd. by Liebig's Method) ½ oz., Elixir of Calisaya Bark with Iron (*Ky.*) 1 pint.

Let stand several days, if possible, and filter. (*Ky.*)

50. Elixir Cinchonæ Compositum.—*Compound Elixir of Cinchona.*

Fluid Extract of Yellow Cinchona, Fluid Extract of Erythroxylon, each 10 fl.dr., Tincture of Cacao 20 fl.dr., Aromatic Elixir enough to make 1 pint.

Mix, and filter if necessary. (*Pa.*)

51. Elixir Cinchonæ cum Hypophosphitibus.—*Elixir of Calisaya and Hypophosphites.*

I. Hypophosphite of Calcium, Hypophosphite of Sodium, each 128 gr., Solution of Hypophosphorous Acid, 50%, 128 min., Elixir of Calisaya enough to make 1 pint.

Rub the Hypophosphites to a fine powder and triturate well with the Acid, then gradually add the Elixir and stir until a perfect solution is obtained; after standing 24 hours, filter.

Each fl.dr. represents 5 gr. of Yellow Cinchona Bark, and contains 1 gr. each of Hypophosphite of Calcium and Sodium. (*Pa.*)

II. Sol. of Oil of Orange 1 fl.dr., Detannated Calisaya Liquor (*Ky.*) 8 fl.oz., Improved Syrup of Hypophosphites with Iron (*Ky.*) 8 fl.oz. Filter. (*Ky.*)

52. Elixir Cinchonæ cum Hypophosphitibus et Strychnina.—*Elixir of Calisaya Bark with Hypophosphites and Strychnine.*

Sulphate of Strychnine 1 gr., Water 1 fl. dr., Elixir of Calisaya Bark with Hypophosphites (*Ky.*) 16 fl.oz. (*Ky.*)

53. Elixir Cinchonæ Detannatum.*—See note to Elixir Cinchonæ (No. 48, I).

54. Elixir Cinchonæ et Ferri.*—*Elixir of Cinchona (Calisaya) and Iron.*—Elixir Calisayæ Ferratum; Ferrated Elixir of Cinchona.

I.* Phosphate of Iron (U. S. Ph. '80) 256 gr., Citric Acid 5 gr., Boiling Water 1 fl.oz., Detannated Elixir of Cinchona enough to make 16 fl.oz.

Add the Phosphate of Iron and Citric Acid to the Boiling Water and

dissolve. Then add enough Detannated Elixir of Cinchona to make 16 fl.oz., and filter. Each fl.dr. contains 2 gr. of Phosphate of Iron.

Note.—If Detannated Elixir of Cinchona (see note to *Elixir Cinchonæ*) is not available, and the preparation is wanted at once, use Compound Elixir of Quinine in place of it. (*N. Y. and B.*, revised. *N. F. C.*)

II. Phosphate of Iron 128 gr., Water 2 fl.dr., Elixir of Calisaya Bark (*Ky.*) 1 pint. Dissolve and filter. (*Ky.*)

III. Phosphate of Iron (U. S.) 256 gr., Compound Elixir of Quinine ("Calisaya Elixir" *D. C.*) 16 fl.oz. Dissolve and filter. (*D. C.*)

IV. Sulphate of Quinine 64 gr., Sulphate of Cinchonidine 32 gr., Sulphate of Cinchonine 32 gr., Solution of Phosphate of Iron, 50%, 496 gr., Elixir of Orange enough to make 1 pint.

Rub the Cinchona Alkaloids to a fine powder, and triturate with 12 oz. of Elixir until perfectly dissolved, then add the Iron Solution, and enough Elixir to make *one pint*.

Each fl.dr. contains 1 gr. of Alkaloids and 2 gr. of Phosphate of Iron. (*Pa.*)

55. Elixir Cinchonæ et Gentianæ cum Ferri Malate.*—*Elixir of Cinchona and Gentian with Malate of Iron.*

Malate of Iron (in scales) 128 gr., Extract of Gentian 40 gr., Syrup 4 fl.oz., Elixir of Cinchona 6 fl.oz., Tincture of Vanilla 2 fl.dr., Oil of Cinnamon $\frac{1}{2}$ min., Hot Water 1 fl.oz., Aromatic Elixir enough to make 16 fl.oz.

Dissolve the Malate of Iron and Extract of Gentian in the Hot Water; then mix with the other ingredients.

Each fl.dr. contains 1 gr. of Malate of Iron.

Note.—The Malate of Iron here directed is that which is prepared in form of scales, and not the *Extractum Ferri Pomatum* (*N. F. C.*)

56. Elixir Cinchonæ et Phosphatum Compositum.*—*Compound Elixir of Cinchona (Calisaya) and Phosphates.*

Syrup of Lactophosphate of Calcium 4 fl.oz., Syrup of Lactophosphate of Iron 2 fl.oz., Diluted Phosphoric Acid 1 fl.oz., Sulphate of Quinine 32 gr., Alcohol 4 fl.oz., Spirit of Orange $\frac{1}{2}$ fl.oz., Water enough to make 16 fl.oz.

Dissolve the Sulphate of Quinine in the Acid and Alcohol, previously mixed with the Spirit of Orange. Pour this mixture into the Syrups previously mixed with water, let stand two days and filter, adding sufficient water if necessary through the filter to make the product measure 16 fl.oz. (*N. F. C.* from *Ill.*)

57. Elixir Cinchonæ, Ferri, Bismuthi et Strychninæ.*—*Elixir of Cinchona, Iron, Bismuth, and Strychnine.*—Elixir of Calisaya, Iron, Bismuth, and Strychnine.

I.* Phosphate of Iron (U. S. Ph. 1880) 256 gr., Citrate of Bismuth and Ammonium 128 gr., Sulphate of Strychnine $2\frac{1}{2}$ gr., Boiling Water $1\frac{1}{2}$ fl.oz., Detannated Elixir of Cinchona, enough to make 16 fl.oz.

Add the salts to the Boiling Water and dissolve. Then add enough Detannated Elixir of Cinchona to make 16 fl.oz. and filter.

Each fl.dr. contains 2 gr. of Phosphate of Iron, 1 gr. of Citrate of Bismuth and Ammonium, and $\frac{1}{50}$ gr. of Strychnine. (*N. Y. & B.*, revised. *N. F. C.*)

II. Sulphate of Strychnine $2\frac{1}{2}$ gr., Hot Water, Alcohol, each 2 fl.dr., Elixir Cinchona, Iron and Bismuth, to make 1 pint.

Dissolve the Strychnine in the Water and Alcohol, and add sufficient Elixir to make it measure *one pint*. (*Pa.*)

III. Sulphate of Strychnine 1 gr., Water 2 fl.dr., Elixir of Calisaya Bark with Iron and Bismuth (*Ky.*) 1 pint. Mix and filter. (*Ky.*)

58. Elixir Cinchonæ, Ferri et Bismuthi.*—*Elixir of Cinchona (Calisaya), Iron and Bismuth.*

I.* Phosphate of Iron (U. S. Ph. 1880) 256 gr., Citrate of Bismuth and Ammonium 128 gr., Boiling Water $1\frac{1}{2}$ fl.oz., Detannated Elixir of Cinchona enough to make 16 fl.oz.

Add the Phosphate of Iron and the Citrate of Bismuth and Ammonium to the Boiling Water and dissolve. Then add enough Detannated Elixir of Cinchona to make 16 fl.oz., and filter.

Each fl.dr. contains 2 gr. of Phosphate of Iron, and 1 gr. of Citrate of Bismuth and Ammonium. (*N. Y. & B.*, revised. *N. F. C.*)

II. Sulphate of Quinine 64 gr., Sulphate of Cinchonidine, Sulphate of Cinchonine each 32 gr., Citrate of Bismuth and Ammonium 128 gr., Solution of Phosphate of Iron, 50%, 496 min., Hot Water $\frac{1}{2}$ oz., Elixir of Orange, enough to make 1 pint.

Rub the Cinchona Alkaloids to a fine powder, and dissolve in 12 fl.oz. of the Elixir, dissolve the Citrate of Bismuth and Ammonium in the Hot Water, add the Solution of Phosphate of Iron, and mix all together, and then add enough Elixir to measure *one pint*. (*Pa.*)

III. Pyrophosphate of Iron 128 gr., Ammonio-Citrate of Bismuth 128 gr., Water 2 fl.oz., Elixir Calisaya Bark (*Ky.*) 14 fl.oz. Mix and filter. (*Ky.*)

59. Elixir Cinchonæ, Ferri et Calcii Lactophosphatis.*—*Elixir of Cinchona (Calisaya), Iron, and Lactophosphate of Calcium.*

I.* Phosphate of Iron (U. S. Ph. 1880) 128 gr., Sulphate of Quinine 8 gr., Sulphate of Cinchonine 4 gr., Lactate of Calcium 64 gr., Phosphoric Acid (U. S. Ph. 1880, 50%) 64 min., Water of Ammonia $\frac{1}{2}$ fl.oz., Citric Acid 120 gr., Water $\frac{1}{2}$ fl.oz., Aromatic Elixir, enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Lactate of Calcium 64 gr., Phosphoric Acid, U. S. P., 64 min., Water of Ammonia $\frac{1}{2}$ fl.oz., Citric Acid 2 dr., Elixir of Cinchona and Iron 8 fl.oz., Elixir of Orange, enough to make 1 pint.

Dissolve the Lactate of Calcium in 6 fl.oz. of Elixir of Orange with the aid of the Phosphoric Acid, then rub the Citric Acid to a fine powder, and add to it the Water of Ammonia, add this to the foregoing, and then add the Elixir of Cinchona and Iron and sufficient Elixir of Orange to make *one pint*.

Each fl.dr. contains $\frac{1}{2}$ grain each of Cinchona Alkaloids, of Lactophosphate of Calcium and Phosphate of Iron. (*Pa.*)

III. Detannated Tincture of Cinchona $2\frac{1}{2}$ fl.oz., Aromatic Spirit 2 fl.oz., Syrup of

Lactophosphate Calcium 4 fl.oz., Syrup Lactophosphate Iron 2 fl.oz., Water enough to make 16 fl.oz. (See *Proceed. Ill. Pharm. Assoc.*, 1884). (Ill.)

60. Elixir Cinchonæ, Ferri et Strychninæ.*—*Elixir of Cinchona (Calisaya), Iron and Strychnine.*

Sulphate of Strychnine 1 gr., Water 2 fl.dr., Elixir of Cinchona and Iron enough to make 16 fl.oz.

Dissolve and mix. (*N. F. C.* from *Ky.*)

61. Elixir Cinchonæ, Hypophosphitum et Strychninæ.—*Elixir of Cinchona (Calisaya), Hypophosphites and Strychnine.*

I. Detannated Tincture of Cinchona 8 fl.oz., Sulphate of Strychnine $1\frac{1}{4}$ gr., Water 1 fl.dr., Oil of Orange 6 min., Alcohol 54 min., Syrup of Hypophosphites with Iron, enough to make 16 fl.oz.

Dissolve the Oil in the Alcohol, add the solution to the Tincture; then add the Sulphate of Strychnine previously dissolved in the Water, and finally enough of the Syrup of Hypophosphites with Iron to make 16 fl.oz. (*Ky.*)

II. Solution of Strychnine 128 min., Elixir of Calisaya and Hypophosphites t. m. 1 pint.

Mix. Each fl.dr. represents 5 gr. of Yellow Cinchona Bark, and contains one gr. each of Hypophosphite of Calcium and Sodium and $\frac{1}{10}$ gr. of Strychnine. (*Pa.*)

(2. Elixir Corydalis.—*Elixir of Corydalis.*

Fluid Extract of Corydalis, Fluid Extract of Stillingia, each 1 fl.oz., Fluid Extract of Prickly Ash Bark 3 fl.oz., Fluid Extract of Blue Flag 1 fl.oz., Iodide of Potassium 256 gr., Elixir of Orange enough to make 1 pint.

Dissolve the Iodide of Potassium in the Fluid Extracts, and add enough Elixir of Orange to make *one pint*; after standing 48 hours, filter. (*Pa.*)

63. Elixir Curassao.*—*Elixir of Curaçao.*—Curaçao Cordial.

Spirit of Curaçao 120 min., Orris Root, powd., 30 gr., Deodorized Alcohol 4 fl.oz., Brandy 1 fl.oz., Syrup 7 fl.oz., Citric Acid 30 gr., Carbonate of Magnesium 120 gr., Water enough to make 16 fl.oz.

Add the Spirit of Curaçao to the Deodorized Alcohol. Then mix with the Syrup and Brandy, and finally add enough Water to make 16 fl.oz. Now add the Orris Root and set the mixture aside for 12 hours, occasionally agitating. Finally mix it intimately with the Carbonate of Magnesium, filter through a well-wetted filter, returning the first portions of the filtrate until it runs through clear, and lastly add the Citric Acid, in powder, and dissolve it by agitation. (*N. Y. & B.*, revised. *N. F. C.*)

64. Elixir Erythroxyli.*—*Elixir of Erythroxyton.*—Elixir of Coca.

I.* Fluid Extract of Erythroxyton 2 fl.oz., Deodorized Alcohol 1 fl.oz., Syrup of Coffee 2 fl.oz., Aromatic Elixir enough to make 16 fl.oz.

Mix the Deodorized Alcohol with 1 fl.oz. of Aromatic Elixir and the Syrup of Coffee, and add the Fluid Extract of Erythroxyton. Finally add enough Aromatic Elixir, in several portions and with agitation, to make the product measure 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

II. Fluid Extract of Erythroxyton 2 fl.oz., Compound Elixir of Taraxacum to make 1 pint.

Each fl.dr. represents $7\frac{1}{2}$ gr. of Coca. (*Pa.*)

65. Elixir Erythroxyli Compositum.—*Compound Elixir of Coca.*

Fluid Extract of Erythroxyton, Fluid Extract of Guarana, each 2 fl.oz., Compound Elixir of Taraxacum to make 1 pint.

Each fl.dr. represents $7\frac{1}{2}$ gr. of each, Coca and Guarana. (*Pa.*)

66. Elixir Eucalypti.*—*Elixir of Eucalyptus.*

I. Fluid Extract of Eucalyptus 2 fl.oz., Compound Elixir of Taraxacum, Syrup of Coffee, each 7 fl.oz., Carbonate of Magnesium 120 gr. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Ext. of Eucalyptus 2 fl.oz., Alcohol 6 fl.oz., Simple Elixir (*Aj.*) 8 fl. oz., Solution of Oil of Orange, 30 min.

Mix the Solution of Oil of Orange with the Alcohol, add the Fluid Extract, and then the Elixir. Mix and filter. (*Ky.*)

III. Fluid Extract of Eucalyptus 2 fl.oz., Talcum $\frac{1}{2}$ av. oz., Elixir of Orange, enough to make 1 pint.

Mix the Fluid Extract with the Talcum in a mortar, and gradually add the Elixir and filter. (*Pa.*)

67. Elixir Eucalypti Aromaticum.—*Aromatic Elixir of Eucalyptus.*

Fluid Extract of Eucalyptus 2 fl.oz., Talcum $\frac{1}{2}$ av. oz., Elixir of Orange, Aromatic Elixir of Glycyrrhiza, each 7 fl.oz.

Triturate the fluid Extract with the Talcum and Elixir of Orange and filter, then add the Aromatic Elixir of Glycyrrhiza, the whole to make *one pint.* (*Pa.*)

68. Elixir Euonymi.*—*Elixir of Euonymus.*—Elixir of Wahoo.

I.* Fluid Extract of Euonymus $2\frac{1}{2}$ fl.oz., Syrup of Coffee, Water, each 2 fl.oz., Compound Elixir of Taraxacum enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Euonymus 2 fl.oz., Compound Elixir of Taraxacum 14 fl.oz.

Mix and filter. Each fl.dr. represents $7\frac{1}{2}$ gr. of Wahoo. (*Pa.*)

69. Elixir Ferri et Quininae Hypophosphitum.—*Elixir of Hypophosphites of Iron and Quinine.*

I. Hypophosphite of Iron, Citrate of Potassium, Sulphate of Quinine, each 128 gr., Hypophosphite of Calcium 30 gr., Sugar 4 tr. oz., Orange Flower Water 1 fl.oz., Sol. of Oil Orange 80 min., Alcohol Water, each q. s. to make 16 fl.oz.

Dissolve the Hypophosphite of Iron, with the aid of the Citrate of Potassium, in the Orange Flower Water and enough water to make the

solution measure 7 fl.oz., and dissolve in it the Sugar. Triturate the Quinine with 5 fl.oz. of Alcohol, add a solution of the Hypophosphite of Calcium in $\frac{1}{2}$ fl.oz. of water, and shake the mixture occasionally during an hour. Then filter, and wash the filter with enough Alcohol to make 7 fl.oz. Add the solution of Oil Orange, mix the whole with the solution of Hypophosphite of Iron, and filter.

Each fl.dr. contains 1 gr. each of Hypophosphite of Iron and Hypophosphite of Quinine. (*Ky.*)

II. Solution of Hypophosphite of Iron 768 min., Hypophosphite of Quinine 128 gr., Hypophosphorous Acid, 50%, q. s., Aromatic Elixir enough to make 16 fl.oz.

Mix the Hypophosphite of Quinine with 8 fl.oz. of Aromatic Elixir, and add just enough Hypoph. Acid to dissolve it. Then add the solution of Hypophos. Iron, and lastly, enough Aromatic Elixir to make 16 fl.oz. (*N. Y.*)

70. Elixir Ferri et Quininae Hypophosphitum cum Strychnina.—*Elixir of Hypophosphites of Iron and Quinine with Strychnine.*

Sulphate of Strychnine 1 gr., Water 1 fl.dr., Elixir of Hypophosphite of Iron and Quinine (*Ky.*, No. 69, I) 16 fl.oz. (*Ky.*)

71. Elixir Ferri Hypophosphitis.*—*Elixir of Hypophosphite of Iron.*

I.* Solution of Hypophosphite of Iron 768 min., Aromatic Elixir enough to make 16 tr.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Hypophosphite of Iron, Citrate of Potassium, each 128 gr., Orange Flower Water 1 fl.oz., Sugar 4 tr.oz., Alcohol 5 fl.oz., Solution Oil of Orange 80 min., Water q. s.

Dissolve the Hypophosphite of Iron with the aid of the Citrate of Potassium in the Orange Flower Water and enough Water to make 9 fl.oz. In this dissolve the Sugar, add the Alcohol previously mixed with the Solution of Oil of Orange, and filter. (*Ky.*)

III. Solution of Hypophosphite of Iron 2 fl.oz., Elixir of Orange enough to make 1 pint.

Mix. Each fl.dr. contains 1 gr. of Hypophosphite of Iron. (*Pa.*)

72. Elixir Ferri Lactatis.—*Elixir of Lactate of Iron.*

Lactate of Iron 128 gr., Citrate of Potassium 384 gr., Hot Water 3 fl.oz., Aromatic Elixir enough to make 1 pint.

Dissolve the Lactate of Iron in the Water with the aid of the Citrate of Potassium, and when perfectly dissolved add enough Elixir to make the whole measure *one pint*.

Each fl.dr. contains 1 gr. of Lactate of Iron. (*Pa.*)

73. Elixir Ferri Phosphatis.—*Elixir of Phosphate of Iron.*

Solution Phosphate of Iron, 50%, 510 min., Elixir of Orange enough to make 1 pint.

Each fl.dr. contains 2 gr. of Phosphate of Iron. (*Pa.*)

74. Elixir Ferri Phosphatis, Cinchonidinæ et Strychninæ.*—*Elixir of Phosphate of Iron, Cinchonidine, and Strychnine.*

I.* Phosphate of Iron (U. S. Ph. 1880) 256 gr., Sulphate of Cinchonidine 128 gr., Sulphate of Strychnine $1\frac{1}{4}$ gr., Aromatic Spirit 6 fl.oz., Water 4 fl.oz., Syrup 6 fl.oz., Aromatic Elixir, enough to make 16 fl.oz.

Dissolve the Sulphate of Strychnine in the Aromatic Spirit, contained in a flask, add the Sulphate of Cinchonidine, place the flask into hot water, and shake it well occasionally. Dissolve the Phosphate of Iron in 4 fl.oz. of hot Water, in a capsule, add the Syrup, and heat nearly to the boiling point. Then pour into this hot mixture, all at once, the hot solution of the alkaloids, and shake well immediately. When cold, add enough Aromatic Elixir to make 16 fl.oz., allow to stand for twenty-four hours, and filter.

Each fl.dr. contains 2 gr. of Phosphate of Iron, 1 gr. of Sulphate of Cinchonidine, and $\frac{1}{160}$ gr. of Sulphate of Strychnine.

Note.—The Sulphate of Cinchonidine will all dissolve in the Aromatic Spirit when hot; on mixing the two hot solutions, they will become opaque at first, but will soon become almost or entirely clear. It is important that both solutions should be quite hot when mixed together. (*N. Y. & B.*, revised. *N. F. C.*)

II. Solution of Phosphate of Iron, 50%, 5 to 10 min., Sulphate of Cinchonidine 128 gr., Sulphate of Strychnine $2\frac{1}{2}$ gr., Elixir of Orange, enough to make 1 pint.

Rub the Cinchonidine and Strychnine to a fine powder and dissolve in 12 oz. of the Elixir of Orange; when perfectly dissolved, add the Solution of Phosphate of Iron and enough Elixir of Orange to make *one pint*.

Each fl.dr. contains 2 gr. of Phosphate of Iron, 1 gr. of Sulphate of Cinchonidine, and $\frac{1}{160}$ gr. of Sulphate of Strychnine. (*Pa.*)

75. Elixir Ferri Phosphatis, Quininæ et Strychninæ.*—*Elixir of Phosphate of Iron, Quinine, and Strychnine.*

I.* Phosphate of Iron (U. S. Ph. 1880) 256 gr., Hydrochlorate of Quinine 128 gr., Sulphate of Strychnine $1\frac{1}{4}$ gr., Aromatic Spirit fl.oz., Water 4 fl.oz., Syrup 6 fl.oz., Aromatic Elixir, enough to make 16 fl.oz.

Dissolve the Sulphate of Strychnine in the Aromatic Spirit, contained in a flask, add the Hydrochlorate of Quinine, place the flask into hot water, and shake it well occasionally. Dissolve the Phosphate of Iron in 4 fl.oz. of hot Water, in a capsule; add the Syrup, and heat nearly to the boiling point. Then pour into this hot mixture, all at once, the hot solution of the alkaloids, and shake well immediately. When cold, add enough Aromatic Elixir to make 16 fl.oz., allow to stand for twenty-four hours, and filter.

Each fl.dr. contains 2 gr. of Phosphate of Iron, 1 gr. of Hydrochlorate of Quinine, and $\frac{1}{160}$ gr. of Sulphate of Strychnine. (*N. Y. & B.*, revised after *III.* *N. F. C.*)

Note.—The *III.* remarks to this: "With this troublesome elixir the *N. Y. & B.* for-

mula yields fair results. The manipulation may be improved upon by pouring the alcoholic solution of the alkaloidal salts into the hot solution of iron, phosphate and sugar, instead of the reverse, as directed in the formulary. Mr. Conrad, in following out the directions in the formulary, did not succeed in obtaining a product free from precipitation until the process was modified as above."

"The use of quinine hydrochlorate (muriate) instead of the sulphate has been recommended, and the former salt, owing to its greater solubility, may be employed to advantage in preference to the sulphate. It is not thought that any objections could possibly attend the change from a therapeutic standpoint, while pharmaceutically a great deal would be secured favorable to this largely used elixir."

"This Committee think it would be advisable to reduce the quantity of strychnine in this elixir one-half. A tonic elixir containing $\frac{1}{50}$ gr. of strychnine to the fl.dr., often promiscuously employed, may do considerable mischief. Four fl.dr. may be, and to our knowledge has been, taken at one dose with disagreeable results. This elixir should *not contain more than* $\frac{1}{100}$ of a gr. to the fl.dr." (III.)

The *N. F. C.* had decided to fix two different standards of strength for preparations containing strychnine, one — of $\frac{1}{100}$ gr. in each fl.dr.—for those in which strychnine is purely a tonic, and another— $\frac{1}{50}$ gr. in 1 fl.dr.—for those which are given to produce the characteristic effects of strychnine (such as *Elixir Strychnine Valerianatis*). It is, however, doubtful whether this would be a wise plan. No attempt has been made, therefore, to carry out this plan uniformly in the present collection of formulæ.

II. Strychnine 2 gr., Quinine 64 gr., Phosphate of Iron (U. S.) 128 gr., Alcohol 2 fl.oz., Water, Syrup, each 3 fl.oz., Elixir of Orange (U. S.) 8 fl.oz.

Dissolve the Strychnine, and afterwards the Quinine, in the Alcohol. Dissolve the Phosphate of Iron in the Water. Mix the two solutions, and add the Syrup and Elixir. Filter, if necessary. (*D. C.*)

III. Solution of Phosphate of Iron, 50%, 510 min., Sulphate of Quinine 128 gr., Sulphate of Strychnine $2\frac{1}{2}$ gr., Elixir of Orange enough to make 1 pint.

Proceed as in the Elixir of Phosphate of Iron, Cinchonidine and Strychnine. (No. 74, II.)

Each fl.dr. contains 2 gr. of Phosphate Iron, 1 gr. of Sulphate of Quinine, and $\frac{1}{50}$ gr. of Sulphate of Strychnine. (*Pa.*)

76. *Elixir Ferri Pyrophosphatis*.*—*Elixir of Pyrophosphate of Iron.*

I.* Pyrophosphate of Iron (U. S. Ph. 1880) 256 gr., Water 2 fl.oz., Tincture of Vanilla 1 fl.dr., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Pyrophosphate of Iron 256 gr., Water $\frac{1}{2}$ fl.oz., Simple Elixir (*Ar.*) $15\frac{1}{2}$ fl.oz. (*Ar.*)

III. Solution of Pyrophosphate of Iron, 50%, 510 min., Elixir of Orange enough to make 1 pint. (*Pa.*)

IV. Pyrophosphate of Iron 256 gr., Elixir of Orange (U. S.) 16 fl.oz. (*D. C.*)

77. *Elixir Ferri Pyrophosphatis et Strychninæ*.*—*Elixir of Pyrophosphate of Iron and Strychnine.*

Pyrophosphate of Iron (U. S. 1882) 256 gr., Sulphate Strychnine $1\frac{1}{4}$ gr., Water 2 fl.oz., Tincture of Vanilla 1 fl.oz., Aromatic Elixir enough to make 16 fl.oz.

Dissolve the Pyrophosphate of Iron and the Sulphate of Strychnine in

2 fl.oz. of hot water, and add the solution to 12 fl.oz. of Aromatic Elixir. Then add the Tincture of Vanilla, and finally enough Aromatic Elixir to make 16 fl.oz. (*N. F. C.*)

78. Elixir Ferri Pyrophosphatis, Quininæ et Strychninæ.—*Elixir of Pyrophosphate of Iron, Quinine and Strychnine.*

Pyrophosphate of Iron 240 gr., Sulphate of Quinine 60 gr., Strychnine 1 gr., Citric Acid 5 gr., Alcohol 3 fl.oz., Solution of Oil of Orange 50 min., Distilled Water 7 fl. oz., Water of Ammonia q. s., Syrup enough to make 16 fl. oz.

Triturate the Sulphate of Quinine, Strychnine and Citric Acid together until minutely divided, then add the Alcohol and Solution of Oil of Orange. Warm 6 fl.oz. of the syrup gently (to about 150° F.), and add to the turbid mixture, when, upon stirring, it will become clear. To this add the Pyrophosphate of Iron, previously dissolved in the Distilled Water, and finally, Water of Ammonia (drop by drop), until the Elixir is perfectly neutral to test-paper; filter, and, if necessary, add enough syrup to make the product measure 16 fl.oz. (*Ky.*)

79. Elixir Ferri, Quininæ et Strychninæ.*—*Elixir of Iron, Quinine and Strychnine.*

Tincture of Citro-chloride of Iron 1 fl.oz., Hydrochlorate of Quinine 96 grs., Sulphate of Strychnine 1½ grs., Citrate of Potassium 60 grs., Aromatic Elixir, enough to make 16 fl.oz.

Dissolve the Hydrochlorate of Quinine and Sulphate of Strychnine in 12 fl.oz. of the Aromatic Elixir, then add the Tincture, and afterwards the Citrate of Potassium, which will redissolve any precipitate formed. Lastly add enough Aromatic Elixir to make 16 fl.oz.

Each fl.dr. contains nearly 4 min. of the Tincture of Citro-chloride of Iron, ¾ gr. of Hydrochlorate of Quinine, and ⅓ gr. of Sulphate of Strychnine. (*N. F. C.*)

80. Elixir Ferri, Quininæ et Strychninæ Phosphatum.—*Elixir of the Phosphate of Iron, Quinine and Strychnine.*

Strychnine 2 gr., Quinine 64 gr., Phosphate of Iron, U. S. P. 1880, 128 gr., Alcohol 2 fl.oz., Water, Syrup, each 3 fl.oz., Elixir of Orange (U. S.) 8 fl.oz.

Dissolve the Strychnine and the Quinine in the Alcohol, then dissolve the Phosphate of Iron in the Water. Mix the two solutions, and add the Syrup and the Elixir of Orange. Filter, if necessary.

Each fl.dr. contains 1 gr. of Phosphate of Iron, ½ grain of Quinine, and ⅓ grain of Strychnine. (*D. C.*)

81. Elixir Ferri Salicylatis.—*Elixir of Salicylate of Iron.*

Salicylate of Iron 640 gr., Hot Water, Glycerin, each 2¼ fl.oz., Elixir of Orange enough to make 1 pint.

Dissolve the Salicylate of Iron in the hot Water and Glycerin and add the Elixir; after standing a few days, filter.

Each fl.dr. contains 5 gr. of Salicylate of Iron. (*Pa.*)

82. Elixir Ferri Salicylatis Compositum.—*Compound Elixir of Salicylate of Iron.*

Salicylate of Iron 640 gr., Hot Water, Glycerin, each $2\frac{1}{4}$ fl.oz., Fluid Extract of Colchicum $1\frac{1}{8}$ fl.oz., Deodorized Tincture of Opium $4\frac{1}{2}$ fl.dr., Elixir of Orange enough to make 1 pint.

Dissolve the Iron salt in the hot Water and Glycerin, and add the other ingredients.

Each fl.dr. contains 5 gr. of Salicylate of Iron, $2\frac{1}{2}$ min. of Deodorized Tincture of Opium, and represents 5 gr. of Colchicum. (*Pa.*)

83. Elixir Ferri Valerianatis.—*Elixir of Valerianate of Iron.*

Valerianate of Iron 128 gr., Alcohol 1 fl.oz., Aromatic Elixir, enough to make 1 pint.

Dissolve the Iron salt in the Alcohol and add sufficient Aromatic Elixir to make the whole measure *one pint*.

Each fl.dr. contains 1 gr. of Valerianate of Iron. (*Pa.*)

84. Elixir Frangulæ.*—*Elixir of Frangula.*

I.* Fluid Extract of Frangula 4 fl.oz., Compound Elixir of Taraxacum 4 fl.oz., Aromatic Elixir 8 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Frangula 4 fl.oz., Compound Elixir of Taraxacum 12 fl.oz.

Mix. Each fl.dr. represents 15 gr. of Buckthorn. (*Pa.*)

85. Elixir Gallæ Aromaticum.—*Aromatic Elixir of Galls.*

Galls 1 av.oz., Nutmegs, Cinnamon, each, $\frac{1}{2}$ av.oz., Brandy 6 fl.oz., Elixir of Orange enough to make 1 pint.

Reduce the drugs to a moderately coarse powder, moisten with 1 oz. of Brandy, pack in a percolator, macerate for 24 hours, and continue percolation with the remainder of the Brandy until 6 fl.oz. are obtained; to this add enough Elixir of Orange to measure *one pint*. (*Pa.*)

86. Elixir Gentianæ.*—*Elixir of Gentian.*

I.* Compound Tincture of Gentian 1 fl.oz., Aromatic Spirit 3 fl.dr., Tincture of Vanilla 2 fl.dr., Syrup 1 fl.oz., Aromatic Elixir enough to make 16 fl.oz.

Mix the Compound Tincture of Gentian with the Syrup, add the Tincture of Vanilla and the Aromatic Spirit, and enough Elixir to make 16 fl.oz. Filter. (*N. Y. & B.*, revised. *N. F. C.*)

II. Fluid Extract of Gentian 640 min., Elixir of Orange enough to make 1 pint.

Mix. Each fl.dr. represents 5 gr. of Gentian. (*Pa.*)

III. Fluid Extr. Gentian $\frac{1}{2}$ fl.oz., Tinct. Vanilla 2 fl.dr., Simple Elixir (=Aromatic Elixir I), enough to make 16 fl.oz. (*III.*—See the following.)

IV. Fluid Extr. Gentian $1\frac{1}{2}$ fl.oz., Adjuvant Elixir enough to make 16 fl.oz.

Note.—"It is believed that physicians prefer this Elixir of greater strength than is produced by using the second-last formula quoted. For this reason the last one is preferable, and in this the bitter taste of the Gentian is greatly modified by the Glycyrrhiza in the Adjuvant Elixir." (*III.*)

87. Elixir Gentianæ Compositum.—*Compound Elixir of Gentian.*

I. Gentian 256 gr., Coriander, Bitter Orange Peel, each 60 gr., Alcohol 5 fl.oz.,

Water 9 fl.oz., Sugar $4\frac{1}{2}$ tr.oz., Aromatic Spirit 1 fl.oz., Egg Albumen 120 gr., Citric Acid 5 gr.

Mix the Alcohol and Water, and percolate the Gentian, Coriander and Bitter Orange Peel, previously reduced to a moderately fine powder, with this menstruum, until 13 fl.oz. of percolate are obtained. To this add the Albumen and Citric Acid, and filter. Finally, add the Aromatic Spirit and filter again. (*D. C.*)

II. Compound Fluid Extract of Gentian 640 min., Compound Elixir of Taraxacum to make 1 pint.

Mix. Each fl. dr. represents one fl.dr. of the Compound Tincture of Gentian. U. S. P. (*Pa.*)

88. Elixir Gentianæ cum Tinctura Ferri Chloridi.*—*Elixir of Gentian with Tincture of Chloride of Iron.*

I.* Tincture of Citro-Chloride of Iron 640 min., Elixir of Gentian enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Tincture of Citro-Chloride of Iron 640 Min., Elixir of Gentian, to make 1 pint. (*Pa.*)

Mix. Each fl.dr. represents 5 gr. of Gentian and 5 min. of Tincture of Citro-Chloride of Iron. (*Pa.*)

III. Solution of Chloride of Iron (U. S.) 2 fl.dr., Concentrated Solution of Citrate of Ammonium (*Ky.*) 1 fl.oz., Fluid Extract Gentian $\frac{1}{2}$ fl.oz., Simple Elixir (*Ky.*) $14\frac{1}{4}$ fl.oz. (*Ky.*)

IV. Compound Elixir of Gentian (*D. C.*) 16 fl.oz., Citrate Potassium 4 dr., Tincture of Chloride of Iron 5 fl.dr.

Dissolve the Citrate of Potassium in the Elixir, add the Tincture, and filter if necessary. (*D. C.*)

V. Tincture of Citro-Chloride of Iron 640 min., Elixir of Gentian (stronger, No. 86, IV.) 16 fl.oz. (*Ill.*)

89. Elixir Gentianæ et Ferri Pyrophosphatis.—*Elixir of Gentian and Pyrophosphate of Iron.*

Solution of Oil of Orange 100 min., Sugar 2 tr.oz., Elixir of Pyrophosphate of Iron (*Ky.*) 8 fl.oz., Simple Elixir (*Ky.*) 6 fl.oz., Alcohol $\frac{1}{2}$ fl.oz., Fluid Extract of Gentian $\frac{1}{2}$ fl.oz.

Triturate the Solution of Oil of Orange with the Sugar, dissolve it in the Elixirs previously mixed, then add the Alcohol and Fluid Extract. Mix and filter. (*Ky.*)

90. Elixir Gentianæ Ferratum.*—*Ferrated Elixir of Gentian.*

I.* Phosphate of Iron (U. S. Ph. 1880) 128 gr., Boiling Water $\frac{1}{2}$ fl.oz., Elixir of Gentian, enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Pyrophosphate of Iron 128 gr., Elixir of Gentian (*D. C.*) 16 fl.oz. (*D. C.*)

III. Solution of Phosphate of Iron, 50%, 256 min., Elixir of Gentian enough to make 1 pint. (*Pa.*)

91. Elixir Glycyrrhizæ.*—*Elixir of Glycyrrhiza*.—Elixir of Liquorice.

I.* Purified Extract of Glycyrrhiza 1 tr.oz., Water of Ammonia a sufficient quantity, Aromatic Elixir enough to make 16 fl.oz.

Triturate the Purified Extract of Glycyrrhiza with 12 fl.oz. of Aromatic Elixir gradually added. To 10 fl.oz. of this mixture add Water of Ammonia in drops, constantly stirring, until it is in slight excess. Mix this with the reserved portion, and finally with enough Aromatic Elixir to make 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—The alterations are partly based upon the recommendations made by the *III. Comm.*

II. Solution of Purified Extract of Glycyrrhiza 2 fl.oz., Elixir of Orange (*Pa.*) enough to make 1 pint. (*Pa.*)

Note.—The “Elixir of Liquorice” (*Elixir e Succo Liquiritiæ*; *Elixir Pectorale*) of the Germ. Pharm. is prepared from Purified Extract of Liquorice 10 p., Fennel Water 30 p., Anisated Spirit of Ammonia 10 p.

92. Elixir Glycyrrhizæ Aromaticum.—*Aromatic Elixir of Glycyrrhiza*.

I. Fluid Extract of Glycyrrhiza, Aromatic Tincture, each 2 fl.oz., Alcohol 1 fl.oz., Syrup 4 fl.oz., Water 7 fl.oz.

Mix and filter (*Ky.*)

II. Cardamom, Cinnamon, Staranise, each 160 gr., Coriander, Caraway, each 80 gr., Canella, Nutmeg, Cloves, each 40 gr., Vanilla 240 gr., Alcohol 2 pints, Ammoniated Glycyrrhizin 2½ av.oz., Water q. s., Syrup q. s. to make 10 pints.

Reduce the drugs to a moderately coarse powder and macerate for 8 or 10 days in a mixture of the Alcohol with an equal measure of Water. Then filter off four pints and add the Glycyrrhizin dissolved in 4 fl.oz. of Water. Finally add enough Syrup to make 10 pints, and filter, if necessary. (*Pa.*)

93. Elixir Glycyrrhizæ Compositum.—*Compound Elixir of Liquorice*.

Solution of Purified Extract of Glycyrrhiza, Antimonial Wine, each 1 fl. oz., Camphorated Tincture of Opium 2 fl. oz., Spirit of Nitrous Ether ½ fl. oz., Elixir of Cherries enough to make 1 pint.

Mix in the above order.

This Elixir is of same strength as *Brown Mixture*. (*Pa.*)

94. Elixir Glycyrrhizæ cum Ammonii Chlorido.—*Compound Elixir of Liquorice with Chloride of Ammonium*.

Chloride of Ammonium 10 dr., Compound Elixir of Glycyrrhiza q. s. to make 1 pint.

Dissolve the Chloride of Ammonium in the Elixir.

Each fl.dr. contains 5 gr. of Chloride of Ammonium

95. Elixir Grindeliæ*.—*Elixir of Grindelia*.

I.* Fluid Extract of Grindelia 1 fl.oz., Aromatic Spirit 2 fl.oz., Carbonate of Magnesium 120 gr., Compound Elixir of Taraxacum enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Grindelia 1 fl.oz., Talcum $\frac{1}{4}$ av.oz., Elixir of Orange enough to make 1 pint.

Rub the Fluid Extract with the Talcum in a mortar, and gradually add the Elixir and filter; after which add sufficient Elixir to make the whole measure *one pint*. (Pa.)

96. Elixir Grindeliæ Aromaticum.—*Aromatic Elixir of Grindelia.*

I. Grindelia 2 av.oz., Cinnamon, Cloves, each 1 dr., Anise, Coriander, Cardamom, each $\frac{1}{2}$ dr., Bicarbonate of Potassium 1 dr., Hot Water 1 pint, Tincture of Cudbear 3 fl.dr., Elixir of Orange enough to make 1 pint.

Reduce the drugs to a coarse powder, add the boiling Water in a porcelain or well tinned dish, and boil for half an hour, strain, and evaporate to 4 fl.oz.; when cold, add the Tincture of Cudbear, and enough Elixir of Orange to make *one pint*; after a few days, filter. (Pa.)

II. Fluid Extract of Grindelia 4 fl.oz., Tincture of Asarum Canadense $\frac{1}{2}$ fl.oz., Alcohol $2\frac{1}{2}$ fl.oz., Oil of Cloves 6 min., Simple Elixir (Ky.) 9 fl.oz.

Dissolve the Oil of Cloves in the Alcohol, add the Fluid Extract and Tincture, and then the Elixir. Mix and filter. (Ky.)

97. Elixir Guaiaci.*—*Elixir of Guaiac.*

Tincture of Guaiac, U. S. Ph., 1 fl.oz., Carbonate of Potassium 5 gr., Glycerin, Compound Elixir of Taraxacum, Syrup, each 1 fl.oz., Water 30 min.

Mix the Tincture of Guaiac with the Carbonate of Potassium, previously dissolved in $\frac{1}{2}$ fl.dr. of water, then add the other ingredients in the order named, shaking after each addition. (N. F. C.)

98. Elixir Guarana.*—*Elixir of Guarana.*

I.* Fluid Extract of Guarana $2\frac{2}{3}$ fl.oz., Aromatic Elixir 3 fl.oz., Compound Elixir of Taraxacum 10 fl. oz.

Mix and filter, if necessary.

Each fl.dr. represents 10 grains of Guarana. (N. Y. & B., revised. N. F. C.)

II. Fluid Extract Guarana, Alcohol, each 2 fl.oz., Tincture Vanilla 2 fl.dr., Elixir of Orange (U. S.) 8 fl.oz. (D. C.)

III. Fluid Extract Guarana 4 fl.oz., Simple Elixir (Ky.) 12 fl.oz. (Ky.)

IV. Fluid Extract of Guarana 4 fl.oz., Elixir of Orange, Compound Elixir of Taraxacum, each 6 fl.oz. (Pa.)

99. Elixir Guaranae Compositum.—*Compound Elixir of Guarana.*—Elixir of Guarana and Celery.

Fluid Extract of Guarana, Fluid Extract of Celery, each 3 fl.oz., Elixir of Orange, Compound Elixir of Taraxacum, each 5 fl.oz. (Pa.)

100. Elixir Humuli.*—*Elixir of Humulus.*—Elixir of Hops.

I.* Fluid Extract of Hops 2 fl.oz., Tincture of Vanilla 1 fl.oz., Compound Elixir of Taraxacum 2 fl.oz., Carbonate of Magnesium 120 grs., Aromatic Elixir enough to make 16 fl.oz. (N. Y. & B., unaltered. N. F. C.)

II. Fluid Extract Hops (made after formula for Fl. Ext. Gentian U. S.) $2\frac{1}{2}$ fl.oz., Simple Elixir (*Ky.*) $13\frac{1}{2}$ fl. oz. (*Ky.*)

101. Elixir Hypophosphitum Compositum.*—*Compound Elixir of Hypophosphites.*

I.* Hypophosphite of Calcium, Hypophosphite of Sodium, each 128 gr., Hypophosphite Potassium 64 gr., Solution of Hypophosphite of Iron 384 min., Water, Syrup, each 4 fl.oz., Aromatic Elixir, enough to make 16 fl.oz.

Dissolve the solid Hypophosphites in the Water, and add the Solution of Hypophosphite of Iron and the Syrup, and finally, enough Aromatic Elixir to make 16 fl.oz., and filter.

Each fl.dr. contains 1 gr. each of Hypophosphite of Calcium and Sodium, and $\frac{1}{2}$ gr. each of Hypophosphite of Potassium and Iron. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Hypophosphite of Calcium, Hypophosphite of Sodium, each 128 gr., Hypophosphite of Potassium 64 gr., Solution of Hypophosphite of Iron 1 fl.oz., Elixir of Orange, enough to make 1 pint.

Dissolve the Hypophosphites by trituration in a mortar with about 12 oz. of the Elixir; when completely dissolved, add the Solution of Hypophosphite of Iron and enough Elixir of Orange to make *one pint.* (*Pa.*)

III. "An Elixir of Hypophosphites of the strength of the officinal Syrupus Hypophosphitum is wanted, flavored with the Spiritus Cardamomi Comp. of the N. Y. & B. F." (*Wisc.*)

102. Elixir Laxativum Compositum.—*Compound Laxative Elixir.*

Fluid Extract of Rhamnus Purshiana 2 fl.oz., Fluid Extract of Juglans 1 fl.oz., Fluid Extract of Glycyrrhiza $\frac{1}{2}$ fl.oz., Compound Tincture of Cardamom $\frac{1}{2}$ fl.oz., Senna in coarse powder 560 gr., Aromatic Spirit 2 fl.oz., Alcohol 1 fl.oz., Sugar 7 tr.oz., Water enough to make 16 fl.oz.

Exhaust the Senna with boiling Water, so as to obtain 5 fl.oz. of infusion. Allow this to cool, add 1 fl.oz. Alcohol, let it stand for awhile, then pour off the clear liquid and in the latter dissolve the Sugar. With this syrup mix the Aromatic Spirit and the Compound Tincture of Cardamom, then add the Fluid Extracts, and finally, enough Water to make 16 fl.oz. Dose: 1–2 teaspoonfuls, in habitual constipation. (*Ill.*)

103. Elixir Lithii Bromidi.*—*Elixir of Bromide of Lithium.*

I.* Bromide of Lithium 640 gr., Citric Acid 30 gr., Adjuvant Elixir enough to make 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to Elixir Ammonii Bromidi.

II. Bromide of Lithium 640 gr., Adjuvant Elixir enough to make 1 pint. (*Pa.*)

104. Elixir Lithii Citratis.—*Elixir of Citrate of Lithium.*

Citrate of Lithium 640 gr., Adjuvant Elixir enough to make 1 pint. (*Pa.*)

105. Elixir Lithii Salicylatis.—*Elixir of Salicylate of Lithium.*

Salicylate of Lithium 640 gr., Adjuvant Elixir, enough to make 1 pint. (*Pa.*)

106. Elixir Lupulini.*—*Elixir of Lupulin.*

I.* Fluid Extract of Lupulin 2 fl.oz., Carbonate of Magnesium, 2 tr.oz., Aromatic Elixir, enough to make 16 fl.oz.

Triturate the Fluid Extract with the Carbonate of Magnesium, gradually adding 14 fl.oz. of Aromatic Elixir. Transfer the whole to a bottle, agitate occasionally during several hours, then filter, and pass enough Aromatic Elixir through the filter to make 16 fl.oz. (*N. F. C.* from *Ky.*)

Note.—The *Ky.* directs its own Simple Elixir.

II. Fluid Extract of Lupulin 640 min., Talcum 2 dr., Elixir of Orange 7 fl.oz., Aromatic Elixir of Glycyrrhiza, to make 1 pint.

Rub the Talcum with the Fluid Extract, then add the Elixirs and filter. (*Pa.*)

107. Elixir Lupulini et Sodii Bromidi.—*Elixir of Lupulin and Bromide of Sodium.*

Fluid Extract of Lupulin 640 min., Talcum 2 dr., Bromide of Sodium 640 gr., Aromatic Elixir of Glycyrrhiza, to make 1 pint.

Proceed as in making the Simple Elixir of Lupulin, and when filtered, dissolve the Bromide of Sodium in the Elixir. (*Pa.*)

108. Elixir Malti cum Calcii et Sodii Hypophosphitibus.—*Elixir of Malt with Hypophosphites of Calcium and Sodium.*

Hypophosphite of Calcium, Hypophosphite of Sodium, each 128 gr., Adjuvant Elixir, Fluid Extract of Malt, each, 8 fl.oz.

Dissolve the Hypophosphites of Calcium and Sodium in the Elixir of Orange, and add the Fluid Extract of Malt. (*Pa.*)

109. Elixir Malti et Ferri.*—*Elixir of Malt and Iron.*

I.* Extract of Malt 4 fl.oz., Phosphate of Iron (U. S. Ph. 1880) 128 gr., Water 1½ fl.oz., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Solution of Phosphate of Iron, 50%, 256 min., Fluid Extract of Malt, Elixir of Orange, each 8 fl.oz.

Mix the Solution of Phosphate of Iron with the Elixir of Orange, and then add the Fluid Extract of Malt, shaking well; let the mixture stand for 48 hours, and filter, if necessary. (*Pa.*)

110. Elixir Matico Compositum.*—*Compound Elixir of Matico.*

Fluid Extract of Matico 2 fl.oz., Fluid Extract of Buchu, Fluid Extract of Cubeb, each 1 fl.oz., Alcohol 2 fl.oz., Aromatic Elixir, Compound Elixir of Taraxacum, each 5 fl.oz.

Mix, and filter after 3 days. (*N. F. C.*)

111. Elixir Pancreatini.—*Elixir of Pancreatin.*

Note.—Recommended by *Wis.* Formula wanted.

112. Elixir Pectorale.—*Pulmonic Elixir.*—Lung Tonic.

Solution of Purified Extract of Liquorice 1 fl. oz., Fluid Extract of Squill, Fluid Extract of Senega, Fluid Extract of Ilyoseyamus, each 128 min., Fluid Extract of Sanguinaria, Fluid Extract of Ipecac, each 64 min., Sulphate of Morphine 8 gr., Tincture of Cacao 1 fl. oz., Elixir of Cherries enough to make 1 pint.

Dissolve the Morphine in 2 fl. dr. of warm Water, add to the mixture of the Extracts and the Tincture, and add enough Elixir of Cherries to make 1 pint. Each fl. dr. contains $\frac{1}{15}$ of a grain of Morphia. (*Pa.*)

113. Elixir Pepsini.*—*Elixir of Pepsin.*

I.* Pepsin, dry and undiluted, 128 gr., Hydrochloric Acid 30 min., Syrup 6 fl. oz., Alcohol 4 fl. oz., Compound Elixir of Taraxacum 1 fl. oz., Water enough to make 16 fl. oz.

Agitate the Pepsin with 3 fl. oz. of Water and the Acid until it is dissolved. Then add the Syrup, Compound Elixir of Taraxacum, and the Alcohol, and finally enough Water to make 16 fl. oz.

Each fl. dr. contains 1 gr. of undiluted Pepsin.

Note.—It is recommended that those commercial kinds of undiluted Pepsin be selected which have been ascertained from time to time to be the most active and least affected with disagreeable odor or taste. Should any particular kind of pepsin be found to possess strong digestive powers compared with equal quantities of other kinds, while it is found to leave a comparatively large residue insoluble in acidulated water, it should be remembered that all the active portion goes into solution, and the undissolved residue may, in each case, be rejected as inert. (*N. Y. & B.*, revised. *N. F. C.*)

II. Pepsin in scales, with as little odor as possible, 128 gr., Warm Water 2 fl. oz. Elixir of Orange 14 fl. oz.

Dissolve the Pepsin in the Water, and add the Elixir; filter if necessary. (*Pa.*)

114. Elixir Pepsini, Bismuthi et Strychninæ.*—*Elixir of Pepsin, Bismuth and Strychnine.*

I.* Sulphate of Strychnine $2\frac{1}{2}$ gr., Elixir of Pepsin and Bismuth 16 fl. oz.

Dissolve.

Each fl. dr. contains 2 gr. each of Saccharated Pepsin and Ammonio-Citrate of Bismuth, and $\frac{1}{30}$ gr. of Sulphate of Strychnine. (*N. F. C.* from *D. C.*)

Note.—See remarks to Elixir Pepsini.

II. The *Ky.* directs 1 gr. of Sulphate of Strychnine in 1 pint.

115. Elixir Pepsini et Bismuthi.*—*Elixir of Pepsin and Bismuth.*

I.* Pepsin, dry and undiluted, 128 gr., Citrate of Bismuth and Ammonium 256 gr., Alcohol 4 fl. oz., Syrup 6 fl. oz., Compound Elixir of Taraxacum 1 fl. oz., Water enough to make 16 fl. oz.

Dissolve the Pepsin and the Citrate of Bismuth and Ammonium in 4 fl. oz. of Water, add the Syrup and Compound Elixir of Taraxacum, then add the Alcohol, and enough Water to make 16 fl. oz. Finally, filter. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to Elixir Pepsini. If the Pepsin is acid, it must be neutralized.

II. Pepsin in scales 128 gr., Citrate of Bismuth and Ammonium 256 gr., Warm Water 4 fl.oz., Water of Ammonia 20 min., Elixir of Orange enough to make 1 pint.

Dissolve the Pepsin in 2 oz. of the Water, and add 10 fl.oz. of the Elixir, then dissolve the Citrate of Bismuth and Ammonium in 2 oz. of Water with the aid of the Water of Ammonia, and mix the two solutions, and then add sufficient Elixir to make the whole measure *one pint*. (*Pa.*)

III. Saccharated Pepsin, Citrate of Bismuth and Ammonium, each 256 gr., Alcohol, Rose-water, each 2 fl.oz., Sugar 5 tr.oz., Caramel 30 min., Water, Water Ammonia, each q. s. to make 16 fl.oz.

Dissolve the Citr. Bism. and Amm. in 8 fl.oz. of Water, filter and dissolve the Pepsin, and then the Sugar in the filtrate, without heat. Mix the Alcohol and Rose-water, and add the mixture to the solution. Neutralize the Elixir carefully with Water of Amm., add the Caramel, and strain through Canton flannel, without pressure, adding enough Water through the strainer to make the finished Elixir measure 16 fl.oz. (*D. C.*)

IV. Concentrated Liquid Pepsin, Elixir of Bismuth, each fl.oz. (*Ky.*)

V. Saccharated Pepsin, Ammonio-Citrate of Bismuth, each 256 gr., Glycerin, Aromatic Spirit each 3 fl.oz., Syrup 4 fl.oz., Water enough to make 16 fl.oz.

Dissolve the Pepsin in the Glycerin, mix with the Syrup and add the Aromatic Spirit. To this solution add the Bismuth salt dissolved in 6 fl.oz. of Water. Let stand, filter, and add enough Water to make 16 fl.oz. (*Ill.*)

116. Elixir Pepsini et Ferri.*—*Elixir of Pepsin and Iron.*

I.* Pepsin, dry and undiluted, 128 gr., Hydrochloric Acid 30 min., Phosphate of Iron (U. S. Ph. 1880) 256 gr., Syrup 6 fl.oz., Alcohol 4 fl.oz., Compound Elixir of Taraxacum 1 fl.oz., Water enough to make 16 fl.oz.

Agitate the Pepsin with 3 fl.oz. of Water and with the Hydrochloric Acid, until it is dissolved. Then dissolve in this the Phosphate of Iron, add the Syrup, Alcohol, Compound Elixir of Taraxacum, and afterwards enough Water to make 16 fl.oz. Finally, filter. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to Elixir Pepsini.

II. Pepsin in scales 128 gr., Warm Water 2 fl.oz., Solution of Phosphate of Iron, 50%, 1 fl.oz. and 36 min., Elixir of Orange enough to make 1 pint.

Dissolve the Pepsin in the warm Water, then add the Elixir, and finally the Solution of Phosphate of Iron. (*Pa.*)

117. Elixir Phosphori.*—*Elixir of Phosphorus.*

I.* Spirit of Phosphorus 30 fl.dr., Oil of Staranise 16 min., Glycerin 9 fl.oz., Aromatic Elixir, enough to make 16 fl.oz.

To the Spirit of Phosphorus add the Glycerin and Oil of Staranise, and shake until they form a clear liquid. Then add the Elixir, in small portions at a time, gently agitating after each addition, until a clear mixture results.

Each fl.dr. contains $\frac{1}{50}$ gr. of Phosphorus. (*N. Y. & B.*, unaltered. *N. F. C.*)

III. Tincture of Phosphorus (*Ky.*) 4 fl.oz., Simple Elixir 12 fl.oz.

Mix and filter if necessary. The Elixir should be made as required. (*Ky.*)

II. Solution of Phosphorus 75 min., Alcohol 2 fl.oz., Tincture of Cudbear 2 fl.dr., Elixir of Orange, enough to make 1 pint.

Mix the Solution of Phosphorus with the Alcohol, add the Tincture of Cudbear, and then enough Elixir of Orange to make *one pint*.

Each fl.dr. contains $\frac{1}{100}$ gr. of Phosphorus. (*Pa.*)

118. Elixir Phosphori Compositum.—*Compound Elixir of Phosphorus.*

Solution of Phosphorus 75 min., Strychnine $2\frac{1}{8}$ gr., Sulphate of Quinine 64 gr., Solution of Phosphate of Iron, 50%, 256 min., Alcohol 2 fl.oz., Tincture of Cudbear 2 fl.dr., Elixir of Orange enough to make 1 pint.

Dissolve the Quinine and Strychnine in 8 fl.oz. of the Elixir, and mix with the Solution of Phosphorus, Alcohol and Tincture of Cudbear, previously mixed, then add the Solution of Phosphate of Iron and enough Elixir of Orange to make the whole measure *one pint*.

Each fl.dr. contains $\frac{1}{100}$ gr. of Phosphorus, $\frac{1}{50}$ gr. of Strychnine, $\frac{1}{2}$ gr. of Quinine, and 1 gr. of Phosphate of Iron. (*Pa.*)

119. Elixir Phosphori et Gentianæ.—*Elixir of Phosphorus and Gentian.*

Solution of Phosphorus 75 min., Fluid Extract of Gentian 10 fl.dr., Alcohol 2 fl.oz., Compound Elixir of Taraxacum 5 fl.oz., Elixir of Orange, enough to make 1 pint.

Mix the Solution of Phosphorus with the Alcohol, add 8 oz. of Elixir of Orange, then the Fluid Extract of Gentian and Compound Elixir of Taraxacum, and finally sufficient Elixir of Orange to make the whole measure *one pint*.

Each fl.dr. represents $\frac{1}{100}$ gr. of Phosphorus and 5 gr. of Gentian. (*Pa.*)

120. Elixir Phosphori et Nucis Vomica.*—*Elixir of Phosphorus and Nux Vomica.*

I. *Tincture of Nux Vomica 384 min., Elixir of Phosphorus enough to make 16 fl.oz.

Mix them. Each fl.dr. contains 3 min. of Tincture of Nux Vomica and nearly $\frac{1}{50}$ gr. of Phosphorus. (*N. F. C.*)

II. Solution of Phosphorus 75 min., Alcoholic Extract of Nux Vomica 32 gr., Alcohol 2 fl.oz., Hot Water 1 fl.oz., Tincture of Cudbear 1 dr., Elixir of Orange enough to make 1 pint.

Dissolve the Extract in the hot Water, and, when cold, add to the Solution of Phosphorus, previously mixed with the Alcohol and Tincture of Cudbear, then add enough Elixir to make the whole measure *one pint*.

Each fl.dr. contains $\frac{1}{100}$ gr. of Phosphorus and $\frac{1}{4}$ gr. of Extract of Nux Vomica. (*Pa.*)

121. Elixir Phosphori et Turneræ.—*Elixir of Phosphorus and Damiana.*

Solution of Phosphorus 75 min., Alcohol, Fluid Extract of Damiana, each 2 fl.oz., Elixir of Orange enough to make 1 pint.

Mix the Solution of Phosphorus and Alcohol, add the Fluid Extract, and then add sufficient Elixir of Orange to make the whole measure *one pint*.

Each fl.dr. represents $\frac{1}{100}$ gr. of Phosphorus and $7\frac{1}{2}$ gr. of Damiana. (Pa.)

122. Elixir Phosphori, Quininæ et Strychninæ.—*Elixir of Phosphorus, Quinine and Strychnine.*

Solution of Phosphorus 76 min., Strychnine $2\frac{1}{8}$ gr., Sulphate of Quinine 64 gr., Alcohol 2 fl.oz., Tincture of Cudbear 2 fl.dr., Elixir of Orange enough to make 1 pint.

Dissolve the Quinine and Strychnine in 8 oz. of the Elixir, and add to the Solution of Phosphorus, previously mixed with the Alcohol and Tincture of Cudbear; and then add sufficient Elixir to make *one pint*.

Each fl.dr. contains $\frac{1}{100}$ gr. of Phosphorus, $\frac{1}{80}$ gr. of Strychnine, and $\frac{1}{2}$ gr. of Quinine. (Pa.)

123. Elixir Picis.—*Elixir of Tar.*

Glycerite of Tar (U. S. P. 1870) 4 fl.oz., Elixir of Cherries enough to make 1 pint.

Note.—*Glycerite of Tar.* Triturate 1 oz. of Tar with 2 oz. of Magnesium Carbonate; afterwards with portions of a mixture composed of 4 fl.oz. of Glycerin, 2 fl.oz. of Alcohol and 10 fl.oz. of Water. Express the liquid, put the residue into a percolator, and displace first with the expressed liquid, and afterwards with Water, until 16 fl.oz. of percolate are obtained. (Pa.)

124. Elixir Picis Compositum.—*Compound Elixir of Tar.*

I. Wine of Tar 16 fl.oz., Syrup of Wild Cherry, Syrup of Tolu, each 4 fl.oz., Refined Wood Naphtha, 1 fl.oz., Sulphate of Morphine, 4 gr.

Mix them. (D. C.)

II. Carbonate of Ammonium 2 dr., Salicylic Acid 64 gr., Bromide of Potassium 4 dr., Hot Water $1\frac{1}{2}$ fl.oz., Alkaline Solution of Tar $\frac{1}{2}$ fl.oz., Fluid Extract of Eriodictyon 2 fl.oz., Fluid Extract of Grindelia 1 fl.oz., Solution of Purified Extract of Liquorice 2 fl.oz., Elixir of Cherries enough to make 1 pint.

Rub together in a mortar the Carbonate of Ammonium and the Salicylic Acid with $\frac{1}{2}$ oz. of hot Water; when dissolved add the Bromide of Potassium previously dissolved in 1 oz. of Water; then add the other ingredients in the order named. Mix and filter.

Each fl.dr. contains 2 gr. of Bromide of Potassium, and approximately 1 gr. of Salicylate of Ammonium, and represents $\frac{1}{2}$ gr. of Tar, 8 gr. of Eriodictyon, and 4 gr. of Grindelia. (Pa.)

125. Elixir Picis cum Calcii et Sodii Hypophosphitibus.—*Elixir of Tar and Hypophosphites of Calcium and Sodium.*

Hypophosphite of Calcium, Hypophosphite of Sodium, each 128 gr., Hot Water 2 fl.oz., Elixir of Tar enough to make 1 pint.

Rub the Hypophosphites to a fine powder, add part of the hot Water, and rinse with the rest into the Elixir. (*Pa.*)

126. Elixir Pilocarpi.*—*Elixir of Pilocarpus*.—Elixir of Jaborandi.

I.* Fluid Extract of Pilocarpus 2½ fl.oz., Syrup of Coffee 3 fl.oz., Tincture of Vanilla 5 fl.dr., Compound Elixir of Taraxacum enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Pilocarpus 2 fl.oz. and 5 fl.dr., Elixir of Orange, Elixir of Taraxacum, equal quantities of each to make 1 pint. (*Pa.*)

127. Elixir Potassii Bromidi.*—*Elixir of Bromide of Potassium*.

I.* Bromide of Potassium 1280 gr., Citric Acid 30 gr., Adjuvant Elixir enough to make 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to *Elixir Ammonii Bromidi*.

II. Bromide of Potassium 1 tr. oz., Sugar 1 tr. oz., Solution of Oil Orange 20 min., Solution of Oil Bitter Almond 10 min., Simple Elixir (*Ky.*) 1 pint.

Mix and filter. Color with Cochineal color (see *Liquor coccineus.*) (*Ky.*)

III. Bromide of Potassium 2 av. oz., 5 dr., 1 scr., Aromatic Elixir of Liquorice to make 1 pint.

Each fl.dr. contains 10 gr. of Bromide of Potassium. (*Pa.*)

128. Elixir Potassii Bromidi Compositum.—*Compound Elixir of Bromide of Potassium*.

Bromide of Potassium, Chloral Hydrate, each 4 av.oz., Fluid Extract of Cannabis Indica, Fluid Extract of Henbane, each 128 min., Elixir of Orange, Elixir of Liquorice, equal quantities of each to make 1 pint.

Dissolve the Bromide and Chloral in the Elixirs and add the Fluid Extracts; shake well and in a few days filter.

Each fl.dr. represents 1 gr. each of Indian Hemp and Henbane, and contains 15 gr. each of Chloral Hydrate and Bromide of Potassium. (*Pa.*)

129. Elixir Potassii Iodidi.—*Elixir of Iodide of Potassium*.

Iodide of Potassium 1 av. oz., 2½ dr., 10 gr., Aromatic Elixir of Liquorice to make 1 pint.

Each fl.dr. contains 5 gr. of Iodide of Potassium. (*Pa.*)

130. Elixir Potassii Iodidi Compositum.—*Compound Elixir of Iodide of Potassium*.—Elixir Alterativum; Alterative Elixir.

Iodide of Potassium, Tincture of Citro-Chloride of Iron, each 640 gr., Sugar 4 tr.oz., Spirit of Orange ½ fl.oz., Fluid Extract of Saxifraga, Fluid Extract of Stillingia, Fluid Extract of Menispermum, Fluid Extract of Helonias, each 1½ fl.oz., Water enough to make 16 fl.oz.

Dissolve the Iodide of Potassium in the Water; add the Tincture of Iron, and in this dissolve the Sugar without heat. To the Spirit of Orange add 1 tr.oz. of this Syrup, and to this mixture the Fluid Extracts previously mixed. Finally, add the balance of the Syrup, mix the whole thoroughly, let it stand two days, then filter. (*Ill.*)

131. Elixir Quassiae, Gentianae, Nucis Vomicae et Ferri Phosphatis.—*Elixir of Quassia, Gentian, Nux Vomica and Iron.*

Tincture of Nux Vomica 256 min., Solution Phosphate of Iron, 50%, 256 min., Fluid Extract of Quassia, $\frac{1}{2}$ fl.oz., Compound Fluid Extract of Gentian $\frac{1}{2}$ fl.oz., Aromatic Elixir enough to make 1 pint. (*Pa.*)

132. Elixir Quininæ Bisulphatis.*—*Elixir of Bisulphate of Quinine.*

Bisulphate of Quinine 128 gr., Aromatic Elixir enough to make 16 fl.oz.

Each fl.dr. contains 1 gr. of Bisulphate of Quinine. (*N. F. C.*)

132. Elixir Quininæ Compositum.*—*Compound Elixir of Quinine.*—Elixir of Cinchona Alkaloids; Elixir of Calisaya Alkaloids.

I.* Sulphate of Quinine 16 gr., Sulphate of Cinchonine 8 gr., Aromatic Elixir 16 fl. oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Sulphate of Quinine 9 gr., Sulph. Cinchonine 3 gr., Sulph. Quinidine $2\frac{1}{2}$ gr., Sulph. Cinchonidine $1\frac{1}{2}$ gr., Elixir of Orange (U. S.) 1 pint.

Triturate the mixed sulphates with 2 fl.oz. of the Elixir, pour the mixture into a flask and heat on a water-bath until solution is effected; while still hot, add the remainder of the Elixir. When cold, filter. (*D. C.*)

133. Elixir Quininæ et Strychninæ Valerianatum.*—*Elixir of Valerianate of Quinine and Strychnine.*

Strychnine $2\frac{1}{2}$ gr., Valerianic Acid q. s., Valerianate of Quinine 128 gr., Tincture of Cudbear 2 fl.dr., Aromatic Elixir enough to make 16 fl.oz.

Triturate the Strychnine and Valerianate of Quinine with a little of the Elixir to a smooth paste; mix this with about 4 fl.oz. of the Elixir, and then add just enough Valerianic Acid to dissolve the Alkaloids. Filter, add the Tincture of Cudbear, and enough Aromatic Elixir to make 16 fl.oz. (*N. F. C.*, from *Ky.*)

Note.—See remarks to *Elixir Quininæ Valerianatis*.

134. Elixir Quininæ Valerianatis.*—*Elixir of Valerianate of Quinine.*

Valerianate of Quinine 128 gr., Valerianic Acid q. s., Tincture of Cudbear 2 fl.dr., Aromatic Elixir enough to make 16 fl.oz.

Triturate the Valerianate of Quinine with a little of the Aromatic Elixir to a smooth paste, mix this with about 4 fl.oz. more of the Elixir, and then add just enough Valerianic Acid to dissolve the Quinine salt. Filter, add the Tincture of Cudbear, and enough Aromatic Elixir to make 16 fl oz.

Note.—Should the solution, before filtration, contain a slight excess of Valerianic Acid, which would betray itself by a decided odor, it should be cautiously neutralized by stirring with a glass rod repeatedly dipped into very dilute Water of Ammonia. (*N. F. C.*, after *Ky.*)

135. Elixir Rhamni Purshianæ.*—*Elixir of Rhamnus Purshiana.*—Elixir of Cascara Sagrada.

I.* Fluid Extract of Rhamnus Purshiana, Elixir of Glycyrrhiza, Compound Elixir of Taraxacum, Aromatic Elixir, each 4 fl.oz. (*N. Y. & B.*, revised after *Ill. N. F. C.*)

II. Fluid Extract of Rhamnus Purshiana 2 fl.oz., Tincture of Asarum Canadense $\frac{1}{2}$ fl.oz., Simple Elixir (*Ky.*) $13\frac{1}{2}$ fl.oz. (*Ky.*)

III. Fluid Extract of Rhamnus Purshiana 4 fl.oz., Compound Elixir of Taraxacum 12 fl.oz. (*Pa.*)

136. Elixir Rhei.*—Elixir of Rhubarb.

I.* Sweet Tincture of Rhubarb (U. S.) 8 fl.oz., Deodorized Alcohol 1 fl.oz., Water 3 fl.oz., Glycerin, Syrup, each 2 fl.oz.

Mix the Alcohol, Water, Glycerin and Syrup, and add this solution gradually, and with frequent agitation, to the Tincture. (*N. F. C.*)

II. Fluid Extract of Rhubarb, Tincture of Cacao, each 2 fl.oz., Aromatic Elixir 12 fl.oz.

Mix in the order named. (*Pa.*)

137. Elixir Rhei Aromaticum.—Aromatic Elixir of Rhubarb.

Aromatic Fluid Extract of Rhubarb 1 fl.oz., Elixir of Orange 15 fl.oz.

Mix them. Is equal in strength to Spiced Syrup of Rhubarb, U. S. Pharm. 1870. (*Pa.*)

138. Elixir Rhei et Magnesiae.—Elixir of Rhubarb and Magnesia.

Calcined Magnesia 256 gr., Acetic Acid 4 fl.oz., Fluid Extract of Rhubarb 2 fl.oz., Aromatic Elixir, enough to make 1 pint.

Dissolve the Calcined Magnesia in the Acetic Acid, by the aid of gentle heat, add the Fluid Extract of Rhubarb and enough Aromatic Elixir to make *one pint*.

Each fl.dr. contains about 4 gr. of Acetate of Magnesium and represents $7\frac{1}{2}$ gr. of Rhubarb. (*Pa.*)

139. Elixir Rhei et Sennae.—Elixir of Rhubarb and Senna.

Fluid Extract of Rhubarb, Fluid Extract of Senna, Tincture of Cacao, each 2 fl.oz., Aromatic Elixir 10 fl.oz.

Mix in the order named. (*Pa.*)

140. Elixir Rhei et Sennae cum Magnesia.—Elixir of Rhubarb, Senna and Magnesia.

Calcined Magnesia 256 gr., Acetic Acid 4 fl.oz., Fluid Extract of Rhubarb, Fluid Extract of Senna, each 512 min., Aromatic Elixir enough to make 1 pint.

Dissolve the Calcined Magnesia in the Acetic Acid, by the aid of a gentle heat, add the Fluid Extracts and enough Aromatic Elixir to make *one pint*.

Each fl.dr. contains approximately 4 gr. Acetate of Magnesium, and represents 4 gr. each of Rhubarb and Senna. (*Pa.*)

141. Elixir Rubi.*—Elixir of Rubus.—Elixir of Blackberry.

I.* Fluid Extract of Rubus (U. S. Ph.) 2 fl.oz., Tincture of Vanilla 4 fl.dr., Compound Elixir of Taraxacum 4 fl.oz., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Rubus 2 fl.oz., Elixir of Orange, Compound Elixir of Taraxacum, each 7 fl.oz. (*Pa.*)

142. Elixir Rubi Trivialis Compositum.—*Compound Elixir of Dewberry Root.*

Dewberry Root, in coarse powder, 4 tr.oz., Galls powd., Kino powd., each 240 gr., Cinnamon powd. 120 gr., Cloves powd. 60 gr., Capsicum powd. 10 gr., Tincture of Opium 1 fl.oz., Spirit of Peppermint 1½ fl.dr., Brandy 2 pints, Sugar 14 tr.oz.

Digest during 14 days; express, filter, and dissolve the Sugar in the filtrate. (*D. C.*)

143. Elixir Sennæ.—*Elixir of Senna.*

Deodorized Fluid Extract of Senna 8 fl.oz., Compound Tincture of Cardamom ½ fl.oz., Simple Elixir (*Ky.*) 7½ fl.oz. (*Ky.*)

144. Elixir Sennæ Compositum.—*Compound Elixir of Senna.*

Fluid Extract of Senna 2 fl.oz., Pulp of Tamarinds, purified and strained, 4 oz., Oil of Coriander 12 min., Alcohol 2 fl.dr., Elixir of Orange enough to make 1 pint.

Mix the Oil of Coriander with the Alcohol and add to the Fluid Extract of Senna and the Tamarinds; add the Elixir to make *one pint*.

(Similar to the Confection of Senna of the German Pharmacopœia.) (*Pa.*)

145. Elixir Sennæ et Frangulæ.—*Elixir of Senna and Frangula.*

Fluid Extract of Frangula 2 fl.oz., Elixir of Senna 14 fl.oz. (*Ky.*)

146. Elixir Sodii Bromidi*.—*Elixir of Bromide of Sodium.*

I.* Bromide of Sodium 1280 gr., Citric Acid 30 gr., Adjuvant Elixir enough to make 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to *Elixir Ammonii Bromidi*.

II. Bromide of Sodium, Sugar, each 1 tr.oz., Solution of Oil Orange 20 min., Solution Oil Bitter Almond 10 min. Simple Elixir (*Ky.*) 1 pint. Prepare like No. 127, II. (*Ky.*)

III. Bromide of Sodium 1280 gr., Aromatic Elixir of Glycyrrhiza enough to make 1 pint. (*Pa.*)

147. Elixir Sodii Hypophosphitis*.—*Elixir of Hypophosphite of Sodium.*

I.* Hypophosphite of Sodium 256 gr., Citric Acid 30 gr., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.* revised. *N. F. C.*)

Note.—See remarks to *Elixir Ammonii Bromidi*.

II. Hypophosphite of Sodium 256 gr., Elixir of Orange enough to make 1 pint. (*Pa.*)

148. Elixir Sodii Salicylatis*.—*Elixir of Salicylate of Sodium.*

I.* Salicylate of Sodium 640 gr., Aromatic Elixir enough to make 16 fl.oz.

Dissolve the Salicylate of Sodium in 14 fl.oz. of Aromatic Elixir, filter, and add enough Aromatic Elixir to make 16 fl.oz. (*N. F. C.*, from *Ky.*)

Note.—The *Ky.* directs its own Simple Elixir.

II. Salicylate of Sodium 640 gr., Elixir of Cherries enough to make 1 pint. (*Pa.*)

149. Elixir Stillingiæ Compositum.*—Compound Elixir of Stillingia.

I.* Compound Fluid Extract of Stillingia, Alcohol, Compound Elixir of Taraxacum, each 2 fl.oz., Aromatic Elixir 10 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Compound Fluid Extract of Stillingia 4 fl.oz., Aromatic Elixir 12 fl.oz. (*Pa.*)

150. Elixir Strychninæ Valerianatis.*—Elixir of Valerianate of Strychnine.

I.* Strychnine $2\frac{1}{2}$ gr., Valerianic Acid 6 min., Tincture of Vanilla 2 fl.dr., Water of Ammonia 10 min., Tincture of Cudbear 2 fl.dr., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Strychnine 3 gr., Water 2 fl.dr., Valerianic Acid, q. s., Simple Elixir (*Ky.*) 16 fl.oz.

Dissolve the Strychnine in the Water with the aid of just enough Valerianic Acid. Then mix with the Elixir and filter. (*Ky.*)

III. Strychnine $2\frac{1}{2}$ gr., Valerianic Acid 6 min., Acetic Ether, Tincture of Cudbear, each 2 fl.dr., Elixir of Orange enough to make 1 pint.

Rub the Strychnine with the Acid and 4 oz. of Elixir until dissolved, then add the Ether and Tincture of Cudbear and enough Elixir to make *one pint.* (*Pa.*)

151. Elixir Sumbul.—Elixir of Sumbul.

Fluid Extract of Sumbul $2\frac{1}{2}$ fl.oz., Talcum 4 dr., Adjuvant Elixir enough to make 1 pint.

Rub the Fluid Extract of Sumbul with the Talcum, add 12 oz. of the Elixir, and filter; to the filtrate add enough Elixir to make the whole measure *one pint.* (*Pa.*)

152. Elixir Sumbul Compositum.—Compound Elixir of Sumbul.

Fluid Extract of Sumbul $2\frac{1}{2}$ fl.oz., Fluid Extract of Scutellaria 1 fl.oz., Fluid Extract of Valerian 2 fl.dr., Talcum 4 dr., Adjuvant Elixir enough to make 1 pint.

Proceed as in making the Simple Elixir of Sumbul. (*Pa.*)

153. Elixir Taraxaci Compositum.*—Compound Elixir of Taraxacum.

I.* Taraxacum, Wild Cherry, Sweet Orange Peel, each 480 gr., Glycyrrhiza, Russian, (peeled) 960 gr., Cinnamon, Cardamom, Canada Snake Root, Caraway, Cloves, each 120 gr., Purified Extract of Glycyrrhiza 60 gr., Alcohol, Water, each q. s., Syrup 32 fl.oz.

Grind the solid substances to a moderately coarse (No. 40) powder, and percolate, in the usual manner, with a mixture of 1 volume of Alcohol and 2 volumes of Water, until 16 fl.oz. of percolate are obtained. In this dissolve the Extract, and, lastly, add the Syrup.

Note.—If a precipitate should make its appearance in the Elixir on standing, it should be incorporated with the liquid by shaking, before use. (*N. Y. & B.*, revised. *N. F. C.*)

Additional Note.—The *Ill. Comm.* says: In this formula both glycyrrhiza and the pure extract are directed. As the extraction involves a considerable quantity of drugs there is no need of employing the pure extract, but the quantity of the drug glycyrrhiza should be increased 50 per cent. The cloves, we think, should also be omitted, as it is not a desirable flavor, and objectionable on account of the large quantity of tannin it contains.

II. Taraxacum 5 tr.oz., Wild Cherry 4 tr.oz., Orange Peel 2 tr.oz., Glycyrrhiza, Gentian, Cinnamon, Coriander, each 1 tr.oz., Anise, Caraway, Cardamom, each 2 dr., Alcohol, Water, each q. s., Syrup 2½ pints.

Percolate the dry ingredients, previously powdered, with a mixture of 1 volume of Alcohol and 3 volumes of Water, until pints of 6½ percolate are obtained. Mix this with the Syrup. (*Ky.*)

III. Taraxacum, Sweet Orange Peel, Russian Glycyrrhiza (peeled), each 6 av.oz., Wild Cherry, Cardamom, Anise, Caraway, each 4 av.oz., Cinnamon, Coriander, each 2 av.oz., Tincture Vanilla (U. S.) 2 fl.oz., Alcohol 30 fl.oz., Water 90 fl.oz., Syrup 3 pints.

Reduce the drugs to a moderately coarse powder (No. 40), mix the Alcohol and Water, moisten the powder with the menstruum and pack in a percolator; continue the percolation until 7 pints are obtained; to this add the Tincture of Vanilla and the Syrup, and filter.—Product: 10 pints. (*Pa.*)

154. Elixir Turnerae.*—*Elixir of Turnera*.—Elixir of Damiana.

I.* Fluid Extract of Turnera (Damiana) 2½ fl.oz., Alcohol 4 fl.oz., Glycerin 1 fl.oz., Aromatic Elixir enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Fluid Extract of Damiana 2½ fl.oz., Talcum 3 dr., Aromatic Elixir enough to make 1 pint.

Rub the Fluid Extract with the Talcum, gradually add 8 fl.oz. of the Elixir, and filter; to the filtrate add sufficient Elixir to make the whole measure *one pint*. (*Pa.*)

155. Elixir Viburni.*—*Elixir of Viburnum*.—Elixir of Black Haw.

Fluid Extract of Viburnum 2 fl.oz., Tincture of Cardamom 1 fl.oz., Aromatic Elixir enough to make 16 fl.oz. (*N. F. C.*, from *Ky.*)

156. Elixir Viburni Compositum.—*Compound Elixir of Viburnum*.

Fluid Extract of Viburnum Opulus 10 fl.dr., Fluid Extract of Trillium Erectum 2½ fl.oz., Fluid Extract of Aletris Farinosa 10 fl.dr., Compound Elixir of Taraxacum 11 fl.oz. (*Pa.*)

157. Elixir Zinci Valerianatis.—*Elixir of Valerianate of Zinc*.

Valerianate of Zinc 128 gr., Valerianic Acid 128 min., Alcohol 4 fl.oz., Tincture of Cudbear 2 fl.dr., Elixir of Orange enough to make 1 pint.

Rub the Valerianate of Zinc to a fine powder, and rub well together with the Valerianic Acid and with the Alcohol previously warmed, and when a perfect solution is obtained, add the Tincture of Cudbear, and enough Elixir of Orange to make the whole measure *one pint*. (*Pa.*)

158. Emplastrum Aromaticum.—*Spice Plaster*.

Cloves powd., Cinnamon powd., Ginger powd., each 60 gr., Capsicum powd., Camphor powd., each 30 gr., Simple Cerate 360 gr. (*D. C.*)

159. Emplastrum Fuscum Camphoratum.* — *Camphorated Brown Plaster* (Pharm. Germ.)—Emplastrum Matris Camphoratum.—Camphorated Mother's Plaster.

Red Oxide of Lead 30 p., Olive Oil, common, 60 p., Yellow Wax 15 p., Camphor 1 p.

Triturate the Red Oxide of Lead with a portion of the Oil in the copper kettle in which the mixture is to be boiled, until a smooth paste results. Then add the remainder of the Oil, and boil the whole over a naked fire, under constant stirring, until gas bubbles rise, or the red color of the mixture begins to turn brown. Then moderate the heat, but keep up the stirring until the mixture has acquired a dark brown color, and from time to time allow some drops of it to fall into cold water to test its consistence. When this is satisfactory, remove the heat, add the Wax in small pieces, and finally the Camphor, previously rubbed to a smooth paste with a little Olive Oil. Mix thoroughly, allow the mixture to become somewhat cool, and, while it is still warm, pour the plaster into paper-moulds previously coated with mucilage containing about 5 % of glycerin and dried.

Note.—The Olive Oil intended to be used in the preparation of this plaster is the common grade, having a greenish color. In place of it, Cotton Seed Oil may be used. (*N. F. C.*)

160. **Emulsio Chloroformi** *—*Emulsion of Chloroform.*

Purified Chloroform 40 min., Tincture of Quillaia 4 fl.dr., Distilled Water enough to make 4 fl.oz.

Mix the Chloroform with the Tincture, and afterwards add the Distilled Water. Shake the mixture before use. (*N. F. C.*)

161. **Emulsio Olei Morrhuæ Fortior.** *—*Stronger Emulsion of Cod-Liver Oil.*

I.* Cod Liver Oil 16 fl.oz., Acacia in fine powder 3 tr.oz., Glycerin 2 fl.oz., Sugar 2 tr.oz., Water enough to make 28 fl.oz.

Mix the Acacia with 4 fl.oz. of Water; then make an emulsion with 6 fl.oz. of Cod Liver Oil. Next add the Sugar, and afterwards incorporate with the emulsion alternate portions of the Glycerin and the remainder of the Cod Liver Oil and Water.

Note.—This is a Stock-Emulsion to be used for making the usual 50 % Simple Emulsion of Cod-Liver Oil, or Compound Emulsions containing such additions as may be prescribed by the physician.

Instead of trituration in a mortar, mechanical means (such as a churn, egg-beater, etc.), may be employed for emulsifying the oil. Care should be taken not to suspend or interrupt the trituration or agitation until the emulsifying process is completed, since otherwise the emulsion will not be permanent.

It is advisable to keep this Stock-Emulsion in the bottles in which emulsions are usually dispensed, 7 fl.oz. being put into an 8 oz. bottle, 14 fl.oz. into a 16 oz. bottle, etc. When either a plain or compound emulsion is called for, it is completed by the addition of the required ingredients. (*N. Y. & B.*, revised. *N. F. C.*)

II. Cod Liver Oil 8 tr.oz., Acacia powd., 2 tr.oz., Water 3 tr.oz.

Weigh the Acacia into a wedgewood or porcelain mortar, then the Oil, and triturate until the gum is thoroughly mixed with the Oil. Next weigh into the mixture the Water and triturate the whole briskly, until it thickens and acquires a pasty consistence and a milky whiteness. Now scrape

down the portions adhering to the sides of the mortar and to the pestle, and continue the trituration for a short time, after which add such ingredients as may be prescribed or desired, or transfer the concentrated emulsion to wide-mouthed bottles, for future use. (*Ky.*)

III. Cod Liver Oil 32 fl.oz., Condensed Milk 24 av.oz., Glycerin 3 fl.oz., Water enough to make 64 fl.oz.

Add the Oil gradually to the Condensed Milk contained in a mortar, then 4 fl.oz. of Water, and finally, when the emulsion has been completed, the Glycerin.

Flavor to suit. A suitable combination may be made by mixing Oil of Sassafras, Oil of Gaultheria, each 40 min., Oil of Bitter Almonds 10 min. (*III.*)

162. *Emulsio Olei Morrhue.*—Emulsion of Cod-Liver Oil.*

I.* Stronger Emulsion of Cod-Liver Oil 14 fl.oz., Oil of Sassafras, Oil of Wintergreen, each 15 min., Water enough to make 16 fl.oz. (*N. Y. & B. F.*, unaltered. *N. F. C.*)

Note.—Emulsions of Cod-Liver Oil may be preserved from rancidity or fermentation for a considerable time, by substituting in each pint, 1 to 1½ fl.oz. of Alcohol for an equal volume of Water.

II. Stronger Emulsion of Cod-Liver Oil (*Ky.*) 13 tr.oz., Oil of Wintergreen 24 drops, Syrup 1 fl.oz., Water 3 fl.oz.

Weigh the Stronger Emulsion into a mortar, add the Oil of Wintergreen and triturate thoroughly; then gradually add the Water, and lastly, the Syrup. (*Ky.*)

III. Acacia, powd., 3 av.oz., Glycerin 4 fl.oz., Cod-Liver Oil 8 fl.oz., Oil of Wintergreen, Oil of Bitter Almond, each 20 min., Water sufficient to make 1 pint.

Put the Acacia and 4 oz. of Water into a dry mortar, rub to a smooth paste, and add the Glycerin; then mix the Cod-Liver Oil with the Essential Oils, and add gradually, stirring and rubbing continually until all of the Oil is emulsified; then add enough Water to make the whole measure *one pint*. (*Pa.*)

IV. Acacia, powd., 1½ av.oz., Glyconin, U. S. P. 1½ fl.oz., Hot Water 1½ fl.oz., Cod-Liver Oil 8 fl.oz., Oil of Wintergreen 1 fl.dr., Oil of Bitter Almond, Oil of Coriander, each 8 min., Glycerin 2 fl.oz., Water, sufficient to make 1 pint.

Rub the Acacia with the hot Water to a perfectly smooth mucilage, and, when cold, add the Glyconin; now mix all the oils together, add the mixture to the mucilage, rubbing and beating constantly until a thick paste is formed; then add the Glycerin and enough Water to make the whole measure *one pint*. (*Pa.*)

Note.—The *Pa.* appends the following note: Two forms of Emulsion are presented—one with Gum Arabic only as the emulsifier, and the other with Glyceritum Vitelli (Glyconin, U. S. P.) and Gum Arabic. Both make permanent and perfect emulsions. That with Glyconin makes the best appearance under the microscope, the globules of oil being very small—similar in size to those of milk, and therefore deserving the preference; the only objection being the slight yellow tinge of the emulsion.

163. Emulsio Olei Morrhuæ cum Calcii Hypophosphite.—*Emulsion of Cod Liver Oil with Hypophosphite of Calcium.*

Hypophosphite of Calcium 128 gr., Stronger Emulsion of Cod Liver Oil (*Kj.*) 13 tr.oz., Oil of Wintergreen 24 min., Syrup 1 fl.oz., Water 3 fl.oz.

Weigh the Stronger Emulsion into a mortar, add the Oil of Wintergreen, and triturate thoroughly. Then gradually add the Water in which the Hypophosphite had previously been dissolved, and lastly the Syrup. (*Kj.*)

164. Emulsio Olei Morrhuæ cum Calcii et Sodii Hypophosphitibus.*—*Emulsion of Cod Liver Oil with Hypophosphites of Calcium and Sodium.*

I.* Stronger Emulsion of Cod Liver Oil 14 fl.oz., Oil of Sassafras, Oil of Wintergreen, each 15 min., Hypophosphite of Calcium, Hypophosphite of Sodium, each 64 gr., Water enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Hypophosphite Calcium 128 gr., Hypophosphite Sodium 96 gr., Stronger Emulsion of Cod Liver Oil (*Kj.*) 13 tr.oz., Oil Wintergreen 24 min., Syrup 1 fl.oz., Water 3 fl.oz.

Dissolve the Hypophosphites in the Water, and proceed as in No. 162, II. (*Kj.*)

III. Hypophosphite of Calcium, Hypophosphite of Sodium, each 64 gr., Hot Water 2 fl.oz., Emulsion of Cod Liver Oil 14 fl.oz.

Dissolve the Hypophosphites in the Water, and when cold add to the Emulsion, and shake well. (*Pa.*)

IV. Stronger Emulsion of Cod Liver Oil (*III.*) 8 fl.oz., Hypophosphite Calcium, Hypophosphite Sodium, each 128 gr., Hot Water 4 fl.oz.

Dissolve the Salts in the Water and incorporate with the Emulsion. (*III.*)

165. Emulsio Olei Morrhuæ cum Calcii et Sodii Phosphatibus.*—*Emulsion of Cod Liver Oil with Phosphates of Calcium and Sodium.*

I.* Stronger Emulsion of Cod Liver Oil 14 fl.oz. Oil of Sassafras, Oil of Wintergreen, each 15 min., Phosphate of Calcium, Phosphate of Sodium, each 128 gr., Water enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Phosphate of Calcium 256 gr., Phosphate of Sodium 64 gr., Hydrochloric Acid 128 gr., Stronger Emulsion of Cod Liver Oil (*Kj.*) 13 tr.oz., Oil Wintergreen 24 min., Syrup 1 fl.oz., Water 3 fl.oz.

Dissolve the Salts in the Water with the aid of the Hydrochloric Acid, and proceed as in No. 162, II. (*Kj.*)

III. Phosphate of Calcium, Phosphate of Sodium, each 128 gr., Hydrochloric Acid (*U. S. P.*) 64 min., Water 2 fl.oz., Emulsion of Cod Liver Oil 14 fl.oz.

Dissolve the Phosphate of Calcium in 1 oz. of Water with the aid of the Acid and a gentle heat. Dissolve the Phosphate of Sodium in 1 oz. of Water, and mix the two Solutions with the Emulsion. (*Pa.*)

Note.—The *Pa.* appends the following: “In making Emulsions of Cod Liver Oil to contain Phosphates, the Hypophosphites, or Lacto-Phosphates, or Fluid Extracts of any kind, the Emulsion should be made according to the formula for the *Simple, Emulsion*,

with this exception: that instead of taking water enough to make one pint, add water sufficient to make 14 fl.oz., in allowance for the 2 fl.oz. of salt solutions, or of Fluid Extract subsequently to be added."

166. Emulsio Olei Morrhue cum Calcii Lactophosphate.*—*Emulsion of Cod Liver Oil with Lact-phosphate of Calcium.*

I.* Stronger Emulsion of Cod-Liver Oil 14 fl.oz., Oil of Sassafras, Oil of Winter-green, each 15 min., Lactate of Calcium, Phosphoric Acid (U. S. Ph. 1880: 50%) each 256 min., Water enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

Note.—As this Emulsion will not keep long, it should be prepared in small quantities at a time.

II. Prepared like the Simple Emulsion (No. 162, II) except that 256 gr. of Lactate of Calcium, dissolved in 2 fl.oz. of Diluted Phosphoric Acid, are substituted for 2 fl.oz. of the Water. (*Ky.*)

III. Lactate of Calcium 256 gr., Phosphoric Acid, U. S. P., 256 min., Water 1½ fl.oz., Emulsion of Cod Liver Oil 14 fl.oz. (*Pa.*)

167. Emulsio Olei Morrhue cum Calcii Phosphate.*—*Emulsion of Cod Liver Oil with Phosphate of Calcium.*

I.* Stronger Emulsion of Cod Liver Oil 14 fl.oz., Oil of Sassafras, Oil of Winter-green, each 15 min., Phosphate of Calcium 256 gr., Water enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Prepared like the Simple Emulsion (No. 162, II), except that 256 gr. of Phosphate of Calcium are dissolved in the Water by the aid of 128 gr. of Hydrochloric Acid. (*Ky.*)

III. Phosphate of Calcium 128 gr., Hydrochloric Acid, U. S. P., 64 min., Water 2 fl.oz., Emulsion of Cod Liver Oil 14 fl.oz. (*Pa.*)

168. Emulsio Olei Morrhue cum Calcii, Sodii et Potassii Hypophosphitibus.—*Emulsion of Cod Liver Oil with Hypophosphites of Calcium, Sodium and Potassium.*

I. Hypophosphite of Calcium, Hypophosphite of Sodium, each 64 gr., Hypophosphite of Potassium 32 gr., Hot Water 2 fl.oz., Emulsion of Cod Liver Oil 14 fl.oz.

Dissolve the Hypophosphites in the Water; when cold, add to the Emulsion of Cod Liver Oil. (*Pa.*)

II. Cod Liver Oil 8 fl.oz., Hypophosphite of Calcium 192 gr., Hypophosph. of Potassium, Hypophosph. of Sodium, each 64 gr., Water 6 fl.oz., Glycerin 2 fl.oz., Acacia (granulated) 1 tr.oz., Oil Neroli, Oil Bitter Almond, each 12 drops, Oil Cloves 2 drops.

Dissolve the Salts in one-half of the Water and afterward the Acacia so as to form a mucilage, to which add the Cod Liver Oil in small portions, stirring each time until a perfect emulsion has been formed. Then add the essential Oils. Mix the remainder of the Water with the Glycerin and add it gradually to the emulsion, stirring constantly until incorporated. (*D. C.*)

III. To be prepared like the Simple Emulsion (No. 162, II), except that 128 gr. of Hypophosphite Calcium, 96 gr. of Hypophosph. Sodium, and 64 gr. Hypophosph. Potassium are to be dissolved in the Water. (*Ky.*)

169. Emulsio Olei Morrhue cum Erythroxylo.*—*Emulsion of Cod-Liver Oil with Coca.*

Stronger Emulsion of Cod-Liver Oil 14 fl.oz., Elixir of Coca 2 fl.oz., Oil of Cloves 24 drops.

Mix them. (*N. F. C.*)

170. Emulsio Olei Morrhue cum Hypophosphite.*—*Emulsion of Cod-Liver Oil with Hypophosphite.*

Stronger Emulsion of Cod-Liver Oil 14 fl.oz., Oil of Sassafras, Oil of Wintergreen, each 15 min., any soluble Hypophosphite 128 gr., Water enough to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

171. Emulsio Olei Morrhue cum Pruno Virginiana.*—*Emulsion of Cod-Liver Oil with Wild Cherry.*

I.* Stronger Emulsion of Cod-Liver Oil 14 fl.oz., Oil of Bitter Almond 4 min., Fluid Extract of Wild Cherry 1 fl.oz., Glycerin 1 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. Stronger Emulsion of Cod-Liver Oil (No. 161, II.) 13 tr.oz., Oil of Bitter Almond 8 drops, Syrup 1 fl.oz., Fluid Extract of Wild Cherry 3 fl.oz.

Weigh the Stronger Emulsion into a mortar, add the Oil of Bitter Almond, and triturate thoroughly. Then gradually add the Fluid Extract, and lastly the Syrup. (*Ky.*)

III. Fluid Extract of Wild Cherry Bark 2 fl.oz., Emulsion of Cod-Liver 14 fl.oz. (*Pa.*)

172. Emulsio Olei Morrhue cum Sodii Phosphate.—*Emulsion of Cod-Liver Oil with Phosphate of Sodium.*

Phosphate of Sodium 128 gr., Water 2 fl.oz., Emulsion of Cod-Liver Oil 14 fl.oz.

Dissolve the Phosphate of Sodium in the Water, and add to the Emulsion; shake well together. (*Pa.*)

173. Emulsio Olei Ricini.*—*Emulsion of Castor Oil.*

I.* Castor Oil 5 fl.oz., Acacia in fine powder 2 av.oz., Syrup 3 fl.oz., Tincture of Vanilla 3 fl.dr., Water enough to make 16 fl.oz.

Mix the Syrup with 3 fl.oz. of Water, and triturate the Acacia, in a mortar, with the mixture, to a smooth paste. Then gradually incorporate with it the Castor Oil. Transfer the mixture to a bottle, add the Tincture of Vanilla, and finally enough Water to make 16 fl.oz. Mix thoroughly. Shake the mixture well before dispensing.

Note.—This Emulsion should be freshly prepared when required for use. (*N. Y. & B.*, revised. *N. F. C.*)

II. Castor Oil 4 tr.oz., Acacia powd. 1 tr.oz., Water 1½ tr.oz., Syrup, Cinnamon Water, each 3 fl.oz., Spirit of Cinnamon (see note to *Spiritus Aurantii*) 12 min.

Emulsify the Castor Oil with the Acacia and Water, then add the other ingredients successively, with constant trituration. (*Ky.*)

III. Acacia powd. 3 av.oz., Water 4 fl.oz., Castor Oil 8 fl.oz., Oil of Wintergreen 1 fl.dr., Glycerin 2 fl.oz., Water, sufficient to make 1 pint.

Rub the Acacia with the Water to a smooth mucilage, mix the Oils to-

gether, and add gradually to the mucilage, rubbing and beating constantly until a perfect emulsion is obtained, then add the Glycerin and sufficient Water to make the whole measure *one pint*. (*Pa.*)

IV. Acacia powd. 1 av.oz., Castor Oil 8 fl.oz., Glyconin 3 fl.oz., Oil of Spearmint 30 min., Glycerin 3 fl.oz., Water, sufficient to make 1 pint.

Rub the Acacia with 2 oz. of Water to a smooth mucilage, add the Glycerin, then mix the Oils and add them gradually to the mucilage, stirring constantly until an emulsion is formed; then add the Glycerin and enough Water to make *one pint*. (*Pa.*)

Note.—The *Pa.* appends the following note: For Emulsion of Castor Oil two formulas are also presented, as for the manufacture of Emulsion of Cod-Liver Oil; the preference, however, may also be given to the Glyconin formula, for the same reason.

174. Emulsio Olei Terebinthinæ.*—*Emulsion of Oil of Turpentine.*

Oil of Turpentine 2 fl.dr., Acacia in fine powder 30 gr., Syrup $\frac{1}{2}$ fl.oz., Cinnamon Water enough to make 2 fl.oz.

Pour the Oil of Turpentine into a two-ounce bottle, and, having corked it, agitate it so that the inside of the bottle may be completely wetted by the oil. Then add the Acacia, and shake again. Finally add the Syrup and enough Cinnamon Water to make 2 fl.oz., and mix thoroughly by shaking. (*N. Y. & B.*, unaltered. *N. F. C.*)

Note.—This is not a true emulsion, and will separate on standing, but it may be readily restored by shaking. Other essential oils may be emulsified in the same manner.

175. Emulsio Phosphatica.—*Phosphatic Emulsion.*—*Mistura Phosphatica.*

Diluted Phosphoric Acid $1\frac{1}{2}$ fl.oz., Yolk of Egg 3 tr.oz., Cod Liver Oil 8 fl.oz., Glycerin 2 fl.oz., Oil of Bitter Almond 20 min., New England Rum 8 fl.oz., Orange Flower Water, q. s.

Reduce the yolk to a smooth paste, and gradually add the Oils with constant trituration; then add 8 fl.oz. of Orange Flower Water during brisk agitation. Next add the Glycerin, Rum, Phosphoric Acid, and lastly, enough Orange Flower Water to make the finished emulsion measure 32 fl.oz. (*D. C.*)

176. Extractum Buchu Fluidum Compositum.*—*Compound Fluid Extract of Buchu.*

Buchu 8 av.oz., Cubeb, Juniper, Uva Ursi, each 2 av.oz., Mixture of Alcohol 2 volumes and Water 1 volume, q. s. to make 16 fl.oz. (*N. Y. & B.*, unaltered. *N. F. C.*)

177. Extractum Ferri Pomatum.*—*Ferrated Extract of Apples.*—*Ferri Malas Crudus.* Crude Malate of Iron.

Sour Apples 50 parts, Iron, in the form of fine wire, 1 part.

Convert the Sour Apples into a homogeneous pulp by pounding or grinding, and express the liquid portion. Then mix the latter with the Iron, in an enameled or porcelain vessel, and heat it on a water-bath, during several days, until no more bubbles of gas are given off, replacing

from time to time any loss of volume by the addition of water. Dilute the liquid with water to weigh 50 parts, and set it aside for a few days. Then filter, and evaporate the filtrate in the before-mentioned vessel to a thick extract, which should be greenish black, and should yield a clear solution with water.

This preparation contains about 6% of Iron, calculated as metal. (*N. F. C.*, after *Pharm. Germ.*)

178. Extractum Gentianæ Fluidum Compositum.—*Compound Fluid Extract of Gentiana.*

Gentian 9 av.oz., Bitter Orange Peel (Curaçao) 4½ av.oz., Cardamom 2½ av.oz., Glycerin, Water, each 4 fl.oz., Alcohol 8 fl.oz.

Reduce the drugs to a moderately coarse powder (No. 40); mix the fluids together, moisten the powder with 8 oz. of the menstruum, and pack into a percolator; pour on the remainder of the menstruum, and continue percolation with Diluted Alcohol until *one pint* is obtained. (*Pa.*)

179. Extractum Glycyrrhizæ Liquidum.—*Liquid Extract of Glycyrrhiza.*

Note.—"A fluid extract of liquorice is wanted, suitable for mixtures containing quinine."—*H&C.* To prevent confusion with the officinal fluid extract, the above title is provisionally chosen. Formula wanted.

180. Extractum Glycyrrhizæ Purificatum.*—*Purified Extract of Liquorice.*

Extract of Liquorice, in sticks, Water, each a sufficient quantity.

Put a layer of well-washed rye straw over the bottom of a keg or other suitable tall vessel. Then put a single layer of sticks of the best Extract of Liquorice over it. Continue to put in alternate layers of straw and Liquorice until the vessel is full. Fill the latter with cold Water, and allow it to macerate for three days. Then draw off the solution that has formed, by means of a faucet or siphon or otherwise, refill the vessel with cold Water, and proceed as before. Mix the several solutions obtained, allow the liquid to settle, decant the clear solution, and strain the remainder without pressure. Finally evaporate the liquid on a water-bath, to the consistence of an extract.

Note.—Purified Extract of Liquorice should not be confounded with the officinal Pure Extract of Glycyrrhiza. (*N. F. C.*)

181. Extractum Malti Fluidum.—*Fluid Extract of Malt.*

Malt 16 av.oz., Alcohol 2 fl.oz., Glycerin 4 fl.oz., Water 10 fl.oz.

Reduce the Malt to a moderately coarse powder (No. 40), mix the fluids, and moisten the Malt with 8 oz. of the menstruum; pack into a glass percolator, and percolate in the usual manner, using cold Water to finish the percolation, until 16 fl.oz. are obtained. (*Pa.*)

182. Extractum Rhei Fluidum Aromaticum.—*Aromatic Fluid Extract of Rhubarb.*

Rhubarb 6 av.oz., Cinnamon, Cloves, each 2½ av.oz., Nutmeg 6 dr., Glycerin 5 fl.oz., Water 3 fl.oz., Alcohol 8 fl.oz.

Reduce the drugs to a moderately coarse powder (No. 40), mix the fluids, moisten the powder with 6 fl.oz. of menstruum, pack in a percolator, and pour on the remainder; finish the percolation with Diluted Alcohol to make *one pint*. (*Pa.*)

183. Extractum Sennæ Fluidum Deodoratum.—*Deodorized Fluid Extract of Senna.*

Senna, in No. 20 powder, 16 tr.oz., Alcohol, Water, each enough to make 32 fl.oz.

Moisten the Senna with 6 fl.oz. Alcohol, pack it firmly in a glass percolator, let it macerate twenty-four hours, then pour on top 36 fl.oz. of Alcohol, and percolate in the usual manner. When the Alcohol has disappeared from the surface of the powder, follow it by a mixture of 18 fl.oz., each, of Alcohol and Water, and when this has disappeared, pour Water on top until the requisite amount of percolate has been obtained.

Collect the first strongly alcoholic percolate separately. This usually amounts to 42 fl.oz., but the last portions of it may be readily recognized when the dark-brown percolate produced by the diluted alcohol subsequently poured on arrives at the cotton plug placed into the orifice of the percolator. As soon as the first drops of this dark colored percolate have passed through the plug, change the receiver, and continue the percolation, as directed above, until 32 fl.oz. of percolate are obtained.

(If it is desired to prepare the fluid extract of the usual strength, 1 min. for each gr., reserve the first 14 fl.oz. of the second, hydro-alcoholic percolate, evaporate the remainder to the consistence of a soft extract, dissolve this in the reserved portion, and make up the volume to 16 fl.oz. by the addition of a mixture of equal volumes of Alcohol and Water.)

The fluid extract prepared by the above formula represents 1 gr. of Senna in 2 min.

Note.—The first strongly alcoholic percolate contains the objectionable resinous and odorous matters existing in Senna. (*Ky.*)

184. Extractum Stillingiæ Fluidum Compositum.*—*Compound Fluid Extract of Stillingia.*

I.* Stillingia, Corydalis Root, each 4 tr.oz., Iris, Sambucus, Chimaphila, each 2 tr.oz., Coriander, Xanthoxylum Berries, each 1 tr.oz., Diluted Alcohol q. s. to make 16 fl.oz.

Reduce the solids to a moderately coarse (No. 40) powder; moisten this with 4 fl.oz. of Diluted Alcohol, and pack it firmly in a percolator. Then pour Diluted Alcohol on top until the powder is exhausted. Reserve the first 14 fl.oz. of the percolate, evaporate the remainder to 2 fl.oz., and mix with the reserved portion. Finally, filter. (*N. Y. & B.*, revised. *N. F. C.*)

II. Stillingia, Corydalis, each 4 av.oz., Iris, Sambucus, Chimaphila, each 2 av.oz., Coriander, Xanthoxylum Berries, each 1 av.oz., Glycerin, Water, each 4 fl.oz., Alcohol 8 fl.oz.

Reduce the drugs to a moderately coarse powder (No. 40), mix the fluids, add 8 oz. of the menstruum to the powder, pack firmly into a per

colator, and pour on the remainder of the menstruum; close the opening of the percolator, and after macerating for 48 hours, percolate slowly, and finish the operation with Dilute Alcohol until 16 fl.oz. are obtained. (*Pa.*)

185. Extractum Zeæ Fluidum.*—*Fluid Extract of Corn Silk.*—Extractum Stigmatum Maidis Fluidum.

Corn Silk, fresh, 16 tr.oz., Alcohol 16 fl.oz.

Macerate for a week, and express.

186. Ferri Hypophosphis.*—*Hypophosphite of Iron.*

Hypophosphite of Calcium 150 gr., Solution of Chloride of Iron (U. S.), Distilled Water, each q. s.

Dissolve the Hypophosphite of Calcium in 4 fl.oz. of Distilled Water, using a gentle heat if necessary, and filter the solution. To the cold solution carefully add Solution of Chloride of Iron, in small portions, stirring well each time, and allowing the precipitate to subside before adding a new portion. Towards the end, remove a small quantity of the clear supernatant liquid, add to it some dilute Solution of Chloride of Iron, and let it stand a few minutes, if no immediate turbidity occurs. If the liquid remains clear after several minutes' standing, the precipitation may be regarded as complete. Then collect the precipitate upon a close muslin strainer, drain it and express it firmly, and, having poured upon it 1 fl.oz. of Distilled Water, express again, and dry it if it is required in a dry condition.

Note.—It is preferable to use the salt in the form of freshly precipitated and slightly washed magma. To render it soluble, it is triturated first with a definite quantity of citrate of potassium, whereby partial solution is effected. On addition of water or of an aqueous solution containing other hypophosphites, etc., complete solution will take place.

150 gr. of Hypophosphite of Calcium will produce 128 gr. of Ferric Hypophosphite, calculated as dry. (*N. F. C.*, from *Ky.*)

187. Glyceritum Acidi Borici.*—*Boroglyceride.*—Boroglycerinum.

Boric Acid, in fine powder, 62 p., Glycerin 92 p.

Heat the Glycerin in a tared porcelain capsule to a temperature not exceeding 150° C. (302° F.), and add the Boric Acid in portions, continually stirring. When all is added and dissolved, continue the heat at the same temperature, frequently stirring, and breaking up the film which forms on the surface. When the mixture has been reduced to a weight of 100 parts, pour it out on a flat surface previously oiled with a little petrolatum, let it cool, cut it into pieces and transfer them immediately to bottles, which should be kept well closed. (*N. F. C.*)

188. Glyceritum Acidi Borici et Acidi Tannici.*—*Glycerite of Boric and Tannic Acids.*

Boric Acid 5 p., Tannic Acid 10 p., Glycerin 100 p.

Mix the Boric and Tannic Acids with the Glycerin, and heat the mixture, on a water-bath, until the Acids are dissolved.

189. Glyceritum Acidi Tannici.*—*Glycerite of Tannic Acid.*

Tannic Acid 1 tr.oz., Glycerin enough to make 4 fl.oz.

Mix the Tannic Acid with 3 fl.oz. of Glycerin, avoiding the use of a metallic spatula or vessel, and heat the mixture, on a water-bath, until complete solution has been effected. Pour the mixture into a graduate, and when it has become cold, add enough Glycerin to make it measure 4 fl.oz., and mix it thoroughly. (*N. F. C.*)

Note.—This was official in the U. S. P., 1870. The proportions were: 1 tr.oz. of Tannic Acid and 4 fl.oz. Glycerin. It is preferable to make the product definite.

190. Glyceritum Glycyrrhizæ.*—*Glycerite of Liquorice.*

Purified Extract of Liquorice 5 p., Water 5 p., Glycerin 10 p.

Introduce them into a tared vessel and heat on a water-bath until the Extract is completely dissolved. Then restore any Water which may have been lost by evaporation. (*N. F. C.*)

191. Glyceritum Guaiaci.—*Glycerite of Guaiac.*

Resin of Guaiac 1 tr.oz., Solution of Potassa 6 fl.dr., Glycerin 8 fl.oz., Water enough to make 16 fl.oz.

Mix the Solution of Potassa with 2 fl.oz. of Water, and in this solution macerate the Resin of Guaiac for three days. Then filter, and pass Water through the filter until 8 fl.oz. are obtained, and mix this with the Glycerin. (*D. C.*)

192. Glyceritum Hydrastis.—*Glycerite of Hydrastis.*—Glycerole of Hydrastis.

Hydrastis, in No. 60 powder, 16 tr.oz., Alcohol 32 fl.oz., Glycerin 8 fl.oz., Water, enough to make 16 fl.oz.

Mix the Alcohol with 4 fl.oz. of Water, and slowly percolate the Hydrastis with this menstruum in a suitable percolator so that it may be practically exhausted. To the percolate thus obtained, add the Glycerin and Water, and recover the Alcohol by distillation. Let the mixture stand for two days, when a quantity of resinous matter will be found to float on the surface, and a heavy crystalline precipitate will appear on the side and bottom of the vessel. Decant the clear liquid, filter it, and add enough Water to make the product measure 16 fl.oz. (*Ill.*)

193. Glyceritum Pepsini.—*Glycerite of Pepsin.*—Glycerole of Pepsin.

Note.—A concentrated Glycerole of Pepsin is desired by *Ill.*, for making the various liquid pepsin preparations.—Formula wanted.

194. Glyceritum Pepsini et Pteleæ.*—*Glycerite of Pepsin and Wafer-Ash.*

Note.—Suggested as an addition by the *Wisc. Comm.*—Formula wanted.

195. Glyceritum Tragacanthæ.*—*Glycerite of Tragacanth.*

Tragacanth, in fine powder, 3 tr.oz., Glycerin 12 fl.oz., Distilled Water 2 fl.oz.

Mix the Tragacanth with the Glycerin in a mortar, add the Water, and triturate until a translucent, homogeneous jelly is produced.

Note.—This is the process of the Brit. Pharm., the quantities being approximated.

Unguentum Glycerini of the Pharm. Germ., is prepared by triturating 145 gr. of powdered Tragacanth with 2 fl.oz. of Alcohol, then adding 12½ fl.oz. of Glycerin, and heating on a steam-bath, until a homogeneous jelly is produced.

Compare *Mucilago Tragacanthæ* of the U. S. Pharm. (*N. F. C.*)

196. *Gossypium Stypticum*.*—*Styptic Cotton*.

Absorbent Cotton a sufficient quantity, Solution of Chloride of Iron 1 p., Water 2 p.

Mix the liquids in such quantities that the Cotton shall be completely immersed in the liquid, when gently pressed. Having allowed the Cotton to remain in the liquid one hour, remove it, separate the excess of liquid by pressure, pick it so as to loosen it, and dry it by exposure to air, in a place free from dust. Keep in well-closed bottles. (*N. F. C.*)

197. *Infusum Rosæ Compositum*.*—*Compound Infusion of Rose*.

Red Rose ½ tr.oz., Diluted Sulphuric Acid 3 fl.dr., Sugar 1½ oz., Boiling Water 40 fl.oz.

Make the Infusion in a covered glass or porcelain vessel. (*N. F. C.*, from *U. S. Ph.* 1870.)

198. *Iodoformum Aromatisatum*.*—*Aromatized Iodoform*.—"Deodorized Iodoform."

Iodoform 25 p., Cumarin 1 p.

Mix them intimately.

Note.—Many essential Oils, such as those of Peppermint, Cloves, Cinnamon, Citronella, Bergamot, Sassafras, Eucalyptus (also Eucalyptol), etc., may be used for masking the odor of Iodoform. But none of them appear to be as effective or lasting as Cumarin.

When Iodoform has come in contact with the hands, the odor may be most readily removed by washing them with a little tannic acid dissolved in water. (*N. F. C.*)

199. *Lac Fermentatum*.*—*Kumys*.

Cow's Milk, fresh, 32 fl.oz., Yeast, semi-liquid, 1 fl.dr., Sugar 1 tr.oz.

Dissolve the Sugar and the Yeast in the Milk contained in a strong bottle, which has been securely corked, and keep the mixture at a temperature of 75° to 90° F. for six hours; then transfer it to a cold place. (*N. F. C.*)

200. *Linimentum Aconiti et Chloroformi*.*—*Liniment of Aconite and Chloroform*.

Chloroform 2 fl.oz., Tincture of Aconite 2 fl.oz., Soap Liniment 12 fl.oz.

Mix them. (*N. F. C.*)

201. *Linimentum Ammonii Iodidi*.*—*Liniment of Iodide of Ammonium*.

Iodine 30 gr., Oil of Rosemary, Oil of Lavender, each 120 min., Camphor 240 gr., Water of Ammonia 2 fl.oz., Alcohol 16 fl.oz.

Dissolve the Iodine in the Alcohol, then add the Oils and Camphor. When they are dissolved, add the Water of Ammonia. (*N. F. C.*)

202. Linimentum Iodi.*—Liniment of Iodine.

Iodine 455 gr., Iodide of Potassium 200 gr., Glycerin 90 gr., Alcohol 8 fl.oz.

Mix, and dissolve by agitation. (*N. F. C.*, after *Brit. Pharm.*)

203. Linimentum Opii Compositum.*—Compound Opium Liniment.—Canada Liniment.

Tincture of Opium 1 fl.oz., Water of Ammonia, Oil of Peppermint, each $\frac{1}{2}$ fl.oz., Oil of Turpentine 4 fl.oz., Spirit of Camphor, Alcohol, each 1 fl.oz.

Dissolve the Oil of Peppermint in the Alcohol, then add the other ingredients.

Note.—The mixture will separate on standing, and must be shaken when it is to be used. (*N. F. C.*)

204. Linimentum Saponato-Camphoratum.*—Opodeldoc.

Castile Soap, in powder, $1\frac{1}{2}$ tr.oz., Camphor $\frac{1}{2}$ tr.oz., Alcohol 20 fl.oz., Oil of Thyme 30 min., Oil of Rosemary 60 min., Stronger Water of Ammonia 1 fl.oz.

Introduce the Soap, Camphor and Alcohol into a flask or suitable bottle, and apply a gentle heat until solution is effected. Filter the liquid while hot into another flask or bottle; then add the other ingredients; warm until the contents are again liquefied and uniformly mixed. Then pour into small vials, which should immediately be corked and cooled.

Note.—The above given quantities should be divided among 12 vials. Solid Opodeldoc is directed by the *Germ. Pharm.* to be made with soap made from animal fats; but Castile Soap may be used, provided it be previously deprived of water. (*N. F. C.*, after *Pharm. Germ.*)

205. Linimentum Sinapis Compositum.*—Compound Liniment of Mustard.

Oil of Mustard (essential) 1 fl.dr., Ethereal Extract of Mezereon (*Brit. Pharm.*) 40 gr., Camphor 120 gr., Castor Oil 5 fl.dr., Alcohol 4 fl.dr.

Dissolve the Extract of Mezereon and the Camphor in the Alcohol, and add the Oil of Mustard and Castor Oil. (*N. F. C.*, from *Brit. Pharm.*)

206. Linimentum Terebinthinæ Aceticum.—Acetic Turpentine Liniment.—Linimentum Album; Stokes' Liniment; St. John Long's Liniment.

I.* Yolk of Egg one, Acetic Acid 5 fl.dr., Rose Water 20 fl.dr., Oil of Turpentine 3 fl.oz., Oil of Lemon 80 min.

Triturate the Yolk of Egg with the Oil of Turpentine and Oil of Lemon in a mortar until they are thoroughly mixed; then incorporate the Acetic Acid and Rose Water. (*N. F. C.*)

II. Yolk of Egg 1 tr.oz., Oil Lemon 60 min., Rose Water, Oil of Turpentine, each 3 fl.oz., Glacial Acetic Acid 4 fl.dr. (*D. C.*)

207. Linimentum Terebinthinæ Camphoratum.*—Camphorated Turpentine Liniment.

Oil of Turpentine, Acetic Acid, Liniment of Camphor, each 2 fl.oz.

Mix them. (*N. F. C.*)

208. Linimentum Tiglii.*—*Liniment of Croton Oil.*—Linimentum Crotonis.

Croton Oil 1 fl.oz., Oil of Cajuput, Alcohol, each 3½ fl.oz.

Mix them. (*N. F. C.*, from *Brit. Pharm.*)

209. Linimentum Tiglii Compositum.*—*Compound Croton Liniment.*

Croton Oil, Oil of Sassafras, Oil of Turpentine, each 1 fl.oz., Oil of Olive 2 fl.oz.

Mix them. (*N. F. C.*, from *D. C.*)

210. Liquor Acidi Phosphorici Compositus.*—*Compound Solution of Phosphoric Acid.*—Solution of Acid Phosphates.

Bone Ash 100 p., Sulphuric Acid 78 p., Water 400 p.

Mix the Bone Ash with the Sulphuric Acid, diluted with one-half of the Water, and after thoroughly mixing them with a porcelain or glass stirrer, add the other half of the Water and allow the mixture to stand for 24 hours. Then express strongly, using a muslin strainer.—The product has a specific gravity of about 1.113. (*N. F. C.*)

211. Liquor Aluminiumi Acetatis.*—*Solution of Acetate of Aluminium.*

Sulphate of Aluminium, crystallized, Acetic Acid, U. S. P., 36%, each 300 p., Carbonate of Calcium 130 p., Water 1000 p.

Dissolve the Sulphate of Aluminium in 800 p. of Water, add the Acetic Acid, then add the Carbonate of Calcium, rubbed in a mortar with 200 p. of Water. Allow to stand for 24 hours, agitating the mixture occasionally. Then pour off the clear solution and filter.—The Liquor contains 8% of Acetate of Aluminium. (*N. F. C.*)

212. Liquor Ammonii Acetatis Concentratus.—*Concentrated Solution of Acetate of Ammonium.*

Acetic Acid, Carbonate of Ammonium, each q. s.

Neutralize the Acid with the Carbonate of Ammonium, carefully avoiding an excess of the latter.

The product is about 8 times the strength of the officinal solution, and will keep unchanged for a long time. It may be used for making the officinal solution. (*Ky.*)

213. Liquor Ammonii Benzoatis.*—*Solution of Benzoate of Ammonium.*

Carbonate of Ammonium 500 gr., Benzoic Acid 1165 gr., Distilled Water enough to make 16 fl.oz.

Dissolve and filter.—The product contains 1280 gr. of Benzoate of Ammonium. Each fl.dr. contains 10 gr. of this salt. (*N. F. C.*)

214. Liquor Ammonii Citratis Fortior.*—*Stronger Solution of Citrate of Ammonium.*

Citric Acid 9 tr.oz., Stronger Water of Ammonia, Water, each q. s. to make 16 fl.oz.

Neutralize the Acid with the Stronger Water of Ammonia, adding sufficient Water to make 16 fl.oz. The solution should be stored in bottles free from lead.

Note.—Liquor Ammonii Citratis (*Brit. Pharm.*) is prepared from this solution by mixing 1 volume of it with 4 volumes of Water. (*N. F. C.*, after *Ky.* and *Brit. Pharm.*)

215. Liquor Arsenii Bromidi.*—*Solution of Bromide of Arsenic.*—Clemens' Solution of Bromide of Arsenic.

Arsenious Acid, in powder, Carbonate of Potassium, each 73 gr., Bromine 146 gr., Water enough to make 16 fl.oz.

Boil the Arsenious Acid with the Carbonate of Potassium and 10 fl.oz. of Water until solution is effected. Allow to cool and add enough Water to make up the volume to 14 fl.oz. Then add the Bromine, and lastly enough Water to make the product measure 16 fl.oz. Agitate the mixture several times daily during a week, then set it aside until it is colorless (which will require several weeks), when it will be ready for use. Keep in a cool, dark place.

The solution contains, approximately, 1 per cent. of Arsenious Acid. (*N. F. C.*)

216. Liquor Bismuthi.*—*Solution of Bismuth.*—Liquid Bismuth.

Citrate of Bismuth and Ammonium 256 gr., Water of Ammonia a sufficient quantity, Alcohol 2 fl.oz., Distilled Water enough to make 16 fl.oz.

Dissolve the Bismuth salt in 13 fl.oz. of Distilled Water, and allow the solution to stand for a few hours. Should any insoluble matter have deposited, pour off the clear liquid, and add just enough Water of Ammonia to the residue to dissolve it or to render it distinctly but faintly alkaline. Then filter the united liquids, add the Alcohol and enough Distilled Water to make the product measure 16 fl.oz.

This preparation should be freshly prepared when wanted for use. (*N. F. C.*, from *D. C.*)

217. Liquor Bromi.*—*Solution of Bromine.*

Bromine 1 av.oz., Bromide of Potassium 160 gr., Water 4 fl.oz.

Dissolve the Bromide of Potassium in about 1 fl.oz. of the Water, add the Bromine, agitate well, and then add the remainder of the Water.

The solution should be kept in small glass-stoppered vials. To prevent leaking, the stopper should be coated with a little paraffin.

Note.—The original formula, given by Dr. Lawrence Smith, directed 1 tr.oz. of Bromine, which would have to be weighed out. As this substance is very destructive to scales, and there is no necessity in this case for very great exactness (the solution being mostly used externally in gangrene or as a topical application in diphtheria), it is preferable to use an original vial of Bromine containing 1 av.oz. (*N. F. C.*)

218. Liquor Calcis Sulphuratæ.*—*Solution of Sulphurated Lime.*—Solution of Oxysulphuret of Calcium. Vlemincks' Solution (or Lotion).

I.* Slaked Lime 2 p., Sublimed Sulphur 3 p., Water q. s. to make 12 p.

Mix the Slaked Lime with the Sulphur, and add the mixture gradually to 20 p. of Boiling Water. Then boil the whole down under constant stirring, to 12 p., strain, and having allowed the solution to become clear by standing in a well stoppered bottle, remove the clear brown liquid from the sediment and keep it in completely filled and well stoppered bottles. (*N. F. C.*)

II. Sulphur 700 gr., Lime 1000 gr., Water 16 fl.oz.

Boil them together in a porcelain capsule about one hour, stirring occasionally with a glass rod, and replacing from time to time the Water lost by evaporation. Allow it to settle, decant the clear liquid, and keep it in well closed bottles. (*D. C.*)

Note.—This solution, entitled by the *D. C.* “Liquor Calcii Sulphurati” is of a different strength from No. I. It has been placed under the above title for convenience.

219. Liquor Cinchonæ Detannatus.—*Detannated Calisaya Liquor (Ky.)*—see *Tinctura Cinchonæ Detannata*.

220. Liquor Coccineus.*—*Cochineal Color*.

Cochineal 1 tr.oz., Carbonate of Potassium, Alum, in powder, each $\frac{1}{2}$ tr.oz., Bitartrate of Potassium 1 tr.oz., Water 8 fl.oz.

Reduce the Cochineal to a fine powder, add the Carbonate of Potassium, and triturate with 8 fl.oz. of Water. Allow the mixture to stand one hour; add the Alum and Bitartrate of Potassium successively, and when effervescence has ceased, the remaining Water; then filter.

This solution should not be prepared in larger quantity than may be required for immediate use. (*N. F. C.*, from *Ky.*)

221. Liquor Electropæicus.*—*Battery Fluid*.

A. For the Carbon and Zinc Battery.

1. For ordinary use.

Bichromate of Potassium, in powder, 6 av.oz., Sulphuric Acid, commercial, 5 fl.oz., Water, cold, 3 pints.

Add the Sulphuric Acid slowly to the Water. Allow the liquid to become cold, then add the Bichromate, and dissolve by stirring.

2. For use with the Galvano-Cautery.

Bichromate of Potassium $6\frac{1}{2}$ av.oz., Sulphuric Acid, commercial, 13 fl.oz., Water 3 pints.

To 1 pint of cold Water add slowly 8 fl.oz. of Sulphuric Acid; pour the mixture upon the Bichromate and stir until it is dissolved; then add two (2) pints of Water, and when the mixture has become cold, add slowly 5 fl.oz. more of Sulphuric Acid.

B. For the Leclanché Battery.

Chloride of Ammonium 6 av.oz., Water enough to make 20 fl.oz.

Dissolve. Fill the cell with this solution to near the top. (*N. F. C.*)

222. Liquor Extracti Glycyrrhizæ Purificati.—*Solution of Purified Extract of Black Liquorice.*

Extract of Liquorice, in sticks, 16 av.oz., Alcohol 2 fl.oz., Water a sufficient quantity.

Pack the unbroken sticks of Black Liquorice in a suitable percolator in rows, with a layer of clean straw between each row, and cover with cold Water, having first closed the outlet of the percolator; macerate for 48 hours, and percolate very slowly, adding cold Water to the percolator from time to time until exhausted. Evaporate the percolate to 14 fl.oz., and when cold add the Alcohol. (*Pa.*)

Note.—The *Pa.* entitles this “*Solutio Extracti Glycyrrhizæ Purificati.*”

223. Liquor Ferri Protochloridi.—*Solution of Protochloride of Iron.*—Solution of Ferrous Chloride.

Iron Wire, cut fine, $2\frac{1}{4}$ av.oz., Hydrochloric Acid q. s., Glycerin, Syrup, each 3 fl.oz., Water enough to make 16 fl.oz.

Dissolve the Iron Wire in $5\frac{1}{2}$ av.oz. of Hydrochloric Acid with the aid of a gentle heat. Then filter and evaporate the filtrate nearly to dryness. Dissolve the residue in 8 fl.oz. of Water and 120 gr. of Hydrochloric Acid, filter again if necessary, and add the Glycerin, Syrup, and enough Water to make 16 fl.oz. Finally, expose the liquid to sunlight.—Each fl.oz. contains 3 drachms of Ferrous Chloride. (*Pa.*)

Note.—The *Pa.* entitles this *Liquor Ferri Chloridi*, which, being the official title of the Solution of *Ferric* Chloride, had to be altered.

224. Liquor Ferri et Ammonii Citratis.—*Solution of Citrate of Iron and Ammonium.*

I. Solution of Citrate of Iron, U. S. P., 16 fl.oz., Water of Ammonia 5 fl.oz.

Mix and evaporate over a water bath until 16 fl.oz. remain. (*Pa.*)

II. Ammonio-Citrate of Iron, in scales, 8 av.oz., Water q. s. to make 1 pint.

Dissolve and filter.

Contains 50 per cent. of Citrate of Iron and Ammonium. (*Pa.*)

225. Liquor Ferri et Quininæ Citratis.—*Solution of Citrate of Iron and Quinine.*

I. Solution of Citrate of Iron 15 fl.oz., Sulphate of Quinine $1\frac{1}{2}$ av.oz., Water of Ammonia, Diluted Sulphuric Acid, Water, each q. s.

Dissolve the Sulphate of Quinine in 15 fl.oz. of warm Water, with the addition of as small a quantity of Diluted Sulphuric Acid as possible, and, when cold, precipitate the solution by means of Water of Ammonia; put the whole upon a filter; filter off the liquid and wash the precipitate well with water; add the washed Quinine to the Solution of Citrate of Iron, stir constantly until dissolved; then add very gradually, under constant agitation, $2\frac{1}{4}$ fl.oz. of Water of Ammonia, place over a water bath, and evaporate to 15 fl.oz. (*Pa.*)

II. Citrate of Iron and Quinine, in scales, 8 av.oz., Water q. s. to make 1 pint.

Contains 50 per cent. of Citrate of Iron and Quinine. (*Pa.*)

226. Liquor Ferri Hypophosphitis.*—*Solution of Hypophosphite of Iron.*—Solution of Ferric Hypophosphite.

I.* Sulphate of Iron and Ammonium (U. S. Ph.) 924 gr., Hypophosphite of Sodium 608 gr., Citrate of Potassium 600 gr., Glycerin 1 fl.oz., Water, enough to make 6 fl.oz.

Dissolve the Sulphate of Iron and Ammonium and the Hypophosphite of Sodium, each, in 8 fl.oz. of Water, and, if necessary, filter the solutions separately. Then mix them, stir well; after a few minutes transfer the resulting magma to a close linen or muslin strainer, and wash the precipitate with a little water. Allow it to drain, and express it forcibly, so that the precipitate is apparently dry. Transfer the precipitate from the strainer to a mortar, add to it the Citrate of Potassium, and triturate until a perfectly smooth paste results. Then add the Glycerin, and gradually, while stirring, enough Water to make the product measure 6 fl.oz. Filter, if necessary, and keep the solution in small, well-corked vials, which should be completely filled.

Note.—The theoretical quantity of Hypophosphite of Iron resulting from the reaction between the ingredients above given is 480 gr., and, in practice, this is very closely obtained. 1 gr. of Hypophosphite of Iron is, therefore, contained in 6 min. of the solution. (*N. Y. & B.*, unaltered. *N. F. C.*)

II.* Hypophosphite of Iron, commercial, 480 gr., Citrate of Potassium 720 gr., Glycerin 1 fl.oz., Water enough to make 6 fl.oz.

Triturate the Hypophosphite of Iron with 2 fl.oz. of Water to a perfectly smooth mixture, then add the Citrate of Potassium and Glycerin, and expose the mixture to a gentle heat, until solution has taken place. When cold, add enough Water to make 6 fl.oz., and filter, if necessary. (*N. F. C.*, alternate process.)

III. Sulphate of Iron 4 av.oz., Hypophosphite of Calcium $2\frac{1}{2}$ av.oz., Hot Water 10 fl.oz., Glycerin 2 fl.oz.

Dissolve the Sulphate of Iron (in crystals) in 5 oz. of hot Water, and filter; dissolve the Hypophosphite of Calcium in 6 oz. of hot Water, and filter; mix the two solutions, and, when cold, filter off the solution from the precipitate; wash the precipitate with sufficient cold water to make the entire filtrate measure 10 fl.oz.; add the Glycerin, put into one-oz. vials, cork well, and preserve in a dark, cool place.

Each fl.dr. contains 6 gr. of Hypophosphite of Iron. (*Pa.*)

Note.—The *Pa.* applies the title *Liquor Ferri Hypophosphitis* to this preparation, though it is apparently different, being made from a *ferrous* salt. Yet the resulting hypophosphite soon oxidizes, at least partly, to *ferric*.

227. Liquor Ferri Iodidi.*—*Solution of Iodide of Iron.*

Iodine 2574 gr., Iron Wire 2 av.oz., Hypophosphorous Acid (50 %) 3 fl.dr., Distilled Water enough to make 8 fl.oz.

Mix the Iron Wire with 6 fl.oz. of Distilled Water in a flask, add about one-half of the Iodine, and agitate continuously until the liquid becomes hot. Then moderate the reaction by placing the flask in cold water, or allowing cold water to flow over it, meanwhile keeping up the

agitation. When the reaction has moderated, add one-half of the remaining Iodine at a time, and again carefully moderate the reaction, each time in the manner above directed. Finally raise the contents of the flask to boiling, and filter immediately through moistened pure filtering paper (the point of which is best supported by a loose pallet of absorbent cotton) into a bottle containing the Hypophosphorous Acid. When all the liquid has passed, rinse the flask with $\frac{1}{2}$ fl.oz. of boiling Distilled Water, and pass this through the filter. Cork the bottle and set it aside to cool. Finally add enough Distilled Water to make the product measure 8 fl.oz.

On mixing 1 vol. of this Solution with 5 vol. of Syrup, the product will be practically identical, measure for measure (but not weight for weight), with the officinal Syrupus Ferri Iodidi. Each fl.oz. contains about 54 gr.

228. Liquor Ferri Oxysulphatis.*—*Solution of Oxysulphate of Iron.*

Sulphate of Iron, Nitric Acid, each 120 gr., Water $1\frac{1}{2}$ fl.oz.

Heat on a water-bath until the reaction is completed, and preserve in a stoppered vial.

229. Liquor Ferri Phosphatis.—*Solution of Phosphate of Iron.*

I. Solution of Citrate of Iron, U. S. P. 1880, 16 fl.oz., Phosphate of Sodium 8 av.oz.

Heat the Solution of Citrate of Iron over a water bath, and add the Phosphate of Sodium, stirring until dissolved, and filter. (*Pa.*)

II. Phosphate of Iron, in scales (U. S. P. 1880) 8 av.oz., Water q. s. to make 1 pint.

Dissolve and filter. (*Pa.*)

230. Liquor Ferri Pomatus.*—*Solution of Crude Malate of Iron.*—*Tinctura Ferri Pomata* (Ph. Germ.)—*Tincture of Ferrated Extract of Apples.*

Ferrated Extract of Apples 800 gr., Alcohol $1\frac{1}{2}$ fl.oz., Cinnamon Water enough to make 16 fl.oz.

Dissolve the Extract in 12 fl.oz. of Cinnamon Water, add the Alcohol, filter, and pass enough Cinnamon Water through the filter to make the product measure 16 fl.oz.

Each fl.dr. contains about $\frac{3}{8}$ gr. of Iron, calculated as metal. (*N. F. C.*)

231. Liquor Ferri Pyrophosphatis.—*Solution of Pyrophosphate of Iron.*

I. Phosphate of Sodium $9\frac{1}{2}$ av.oz., Solution of Tersulphate of Iron $9\frac{1}{2}$ fl.oz., Citric Acid 3 av.oz., Water of Ammonia 6 fl.oz., Water 6 pints.

Place the Phosphate of Sodium into an iron vessel, and heat gently until all the water of crystallization has evaporated; then continue the heat until the white mass is heated to dull redness; remove from the fire, and, when cooled, dissolve in 3 pints of Water, and then add to the Solution of Tersulphate of Iron, previously mixed with 3 pints of Water, and

mix thoroughly ; remove the whole to a strainer, and wash the precipitate thoroughly with Water, and when sufficiently drained, add the soft magma to the Citric Acid, previously mixed with the Water of Ammonia and entirely dissolved therein ; then heat upon a water bath, stirring with a glass rod until a clear solution is formed, and evaporate the whole to 16 fl.oz. (*Pa.*)

II. Pyrophosphate of Iron, in scales, 8 av.oz., Water q. s. to make 1 pint. (*Pa.*)

232. Liquor Hydrargyri et Potassii Iodidi.*—*Solution of Iodohydrargyrate of Potassium.* (Channing.)

Iodide of Potassium $3\frac{1}{2}$ gr., Binioidide of Mercury $4\frac{1}{2}$ gr., Water 1 fl.oz.

Dissolve. (*N. F. C.*)

233. Liquor Hypophosphitum.*—*Solution of Hypophosphites.* (Winchester.)

Hypophosphite of Calcium 4 dr., Hypophosphite of Sodium $2\frac{1}{2}$ dr., Hypophosphite of Potassium 2 dr., Water enough to make 16 fl.oz.

Dissolve and filter.

234. Liquor Hypophosphitum Compositus.—*Compound Solution of Hypophosphites.*

Hypophosphite of Calcium 6 dr., Hypophosphite of Sodium, Hypophosphite of Potassium, each 4 dr., Sulphate of Manganese 70 gr., Sulphate of Iron 130 gr., Quinine (Alkaloid) 2 dr., Strychnine (Alkaloid) 12 gr., Hypophosphorous Acid, 50%, 1 fl.oz., Glycerin 4 fl.oz., Water sufficient to make 1 pint.

Dissolve the Sulphates of Iron and Manganese in 2 fl.oz. of hot Water, and filter, and then add $2\frac{1}{2}$ dr. of Hypophosphite of Calcium, previously dissolved in 2 oz. of hot Water ; when cold, filter off the solution from the crystalline mass, and add the solution to 4 fl.oz. of Glycerin ; then dissolve the Quinine and Strychnine in 1 oz. of Water with sufficient Hypophosphorous Acid, and the other Hypophosphites should then be dissolved in the remainder of the Acid and hot Water sufficient to make the whole measure *one pint*. (*Pa.*)

235. Liquor Iodi Carbolisatus.*—*Carbolized Solution of Iodine.*—Boulton's Solution. "French Mixture."

Compound Tincture of Iodine 110 min., Carbolic Acid, liquefied by melting, 40 min., Glycerin $2\frac{1}{2}$ fl.oz., Water enough to make 16 fl.oz.

Mix them, and expose the mixture to sunlight until it has become colorless. (*N. F. C.*)

236. Liquor Iodi Causticus.*—*Iodine Caustic* (Churchill's).

Iodine 120 gr., Iodide of Potassium 240 gr., Water 1 fl.oz.

Dissolve and mix. (*N. F. C.*)

237. Liquor Morphinae Citratis.—*Solution of Citrate of Morphine.*

Morphine 16 gr., Citric Acid 8 gr., Cochineal $\frac{1}{2}$ gr., Water 7 fl.dr., Stronger Alcohol 1 fl.dr.

Triturate together, and filter. (*D. C.*)

238. Liquor Morphinæ, Magendie.—*Magendie's Solution of Morphine.*

Sulphate of Morphine 16 gr., Distilled Water 1 fl.oz.

Dissolve and filter through a small pellet of absorbent cotton. (*N. F. C.*)

Note.—Particular care should be taken in dispensing or labelling this solution, so that it cannot be mistaken for the so-called United States Solution of Morphine (*Liquor Morphinæ Sulphatis*, U. S. Ph. 1870,) which is still in use in many parts of this country, and which is of the strength of 1 gr. of Sulphate of Morphine in each fl.oz.

The development of fungoid growths in this and similar solutions used for hypodermic purposes may be prevented, or at least greatly retarded, by using Chloroform Water instead of Distilled Water. This should, however, be done only with the knowledge, or by the direction, of the prescriber.

Another efficient method is to sprinkle a little Benzoic Acid over the surface of the absorbent cotton through which the solution is filtered. Or, 5 gr. of Boric Acid may be added to each fl.oz.

239. Liquor Pancreaticus.*—Pancreatic Solution.

Pancreas, fresh, 4 tr.oz., Glycerin, Alcohol, each 1 fl.oz., Water 12 fl.oz.

Mix the Pancreas, previously comminuted, with the liquids, macerate for several weeks, frequently shaking, and finally strain.

The liquid portion may be used as soon as the red blood color has disappeared. (*N. F. C.*)

240. Liquor Pepsini Aromaticus.*—Aromatic Solution of Pepsin.—Aromatic Liquid Pepsin.

Saccharated Pepsin 320 gr., Oil of Cinnamon, Oil of Pimenta, each 2 min., Oil of Cloves 4 min., Alcohol $\frac{1}{2}$ fl.oz., Hydrochloric Acid 75 min., Glycerin 6 fl.oz., Water enough to make 16 fl.oz.

Dissolve the Oils in the Alcohol; mix the solution intimately with the Pepsin, by trituration in a mortar, then gradually add the Acid, Glycerin and Water. (*N. F. C.*)

241. Liquor Pepsini Concentratus.—*Concentrated Liquid Pepsin.*

Saccharated Pepsin 1 tr.oz., Hydrochloric Acid 1 fl.dr., Glycerin 6 fl.oz., Distilled Water 10 fl.oz.

Triturate the Saccharated Pepsin with the Hydrochloric Acid, previously diluted with 1 fl.oz. of the Water, add the remainder of the Water, and allow to stand, with occasional agitation, for 24 hours. Then add the Glycerin, mix well, and filter. (*Ky.*)

Note.—See remarks to *Elixir Pepsini* (No. 113).

242, a. Liquor Phosphori.—*Solution of Phosphorus.*

Phosphorus 8 gr., Bromide of Ethyl 8 fl.dr.

Dissolve by agitation, and keep in a glass stoppered vial in a cool, dark place. Each fl.dr. contains 1 gr. of Phosphorus. (*Pa.*)

242, b. Liquor Phosphori, Thompson.*—Thompson's Solution of Phosphorus.

I. Phosphorus 1 gr., Absolute Alcohol 7 fl.dr., Glycerin $1\frac{1}{2}$ fl.oz., Spirit of Peppermint 40 min.

Dissolve the Phosphorus in *five* (5) fl.dr. of Absolute Alcohol, in a securely stoppered vial, by immersion in a water-bath. Allow the solution to cool, and add to it a previously warmed mixture of the remainder of the Alcohol and the Glycerin. Finally add the Spirit of Peppermint. Each fl.dr. contains a little over $\frac{1}{20}$ gr. of Phosphorus.

Note—This solution must not be confounded with the Spiritus Phosphori, which is not intended to be administered as such, but is only to be used in compounding the Elixir or other preparations. (*N. F. C.*)

243. Liquor Picis Alkalinus.*—Alkaline Solution of Tar.

Tar 4 tr.oz., Potassa 2 tr.oz., Water 10 fl.oz.

Dissolve the Potassa in the Water. Shake the solution with the Tar, so that the latter may be dissolved, and filter. (*N. F. C.* and *Pa.*)

244. Liquor Potassæ Chloratæ.*—Solution of Chlorinated Potassa.—Javelle Water.

Carbonate of Potassium 58 p., Chloride of Lime 80 p., Water enough to make 1000 p.

Mix the Chloride of Lime, contained in a tared flask, with 400 p. of Water. Heat the Carbonate of Potassium in another flask with 300 p. of Water to boiling, and pour the hot solution into the mixture first prepared. Shake well, cork the flask well, and set it aside to cool. When cold, add enough Water to make the contents weigh 1000 p. Allow to settle, and separate the clear solution by means of a siphon, or pass the liquid through a muslin strainer.

The clear liquid obtained as a product has the specific gravity 1.050. (*N. F. C.*)

245. Liquor Potassii Permanganatis.*—Solution of Permanganate of Potassium.—Condy's Fluid.

Permanganate of Potassium 128 gr., Distilled Water 16 fl.oz.

Dissolve. Keep the solution in glass or rubber-stoppered bottles. (*N. F. C.*)

246. Liquor Seriparus.*—Liquid Rennet.

Calves' Rennet, fresh, 3 tr.oz., Chloride of Sodium 1 tr.oz., Sherry Wine 26 fl.oz.

Macerate the Rennet (or the washed mucous membrane of the fresh stomach of a suckling calf) with the Chloride of Sodium and Sherry Wine during three days, under frequent agitation, and filter.

If this liquid is used for curdling milk, it must be added to the latter while cold, and the mixture heated to about 35° C. (95° F.), but not exceeding 40° C. (104° F.). 1 p. of the liquid should coagulate from 200 to 300 p. of cow's milk.

247. Liquor Sodii Arseniatis, Pearson.*—Pearson's Solution of Arseniate of Sodium.

Arseniate of Sodium, in crystals, 1 gr., Distilled Water 632 min.

Dissolve and filter. Each fl.dr. contains about $\frac{1}{16}$ gr. of crystallized Arseniate of Sodium.

Note.—The Liquor Sodii Arseniatis of the U. S. Pharm. contains 1 per cent. of the anhydrous salt. This corresponds to 1.677 per cent. of the crystalline salt. Or, 1 p. of the crystalline salt is contained in 59.6 p. of the U. S. Solution. The official solution is, therefore, about *ten times as strong* as Pearson's Solution of the French Pharm. (*N. F. C.*, from *Codex*.)

248. Liquor Sodii Boratis Compositus.*—*Compound Solution of Borate of Sodium.*—Dobell's Solution.

Sodium Borate 60 gr., Carbolic Acid 12 gr., Glycerin 2 fl.dr., Sodium Bicarbonate 60 gr., Water, warm, 8 fl.oz.

Dissolve and mix.

Note.—Dr. Dobell states that in certain cases the Borate of Sodium may be advantageously replaced by Chloride of Ammonium, Chlorate of Potassium, or Condyl's Fluid. (*N. F. C.*)

249. Liquor Sodii Carbolatis.*—*Solution of Carbolate of Sodium.*—Solution of Phenate of Sodium; Phénol Sodique.

Carbolic Acid 5 dr., Soda (caustic) 20 gr., Water 5 fl.dr.

Dissolve and mix. (*N. F. C.*, from *Pharm. Germ. I.*)

250. Liquor Sodii Citratis.*—*Solution of Citrate of Sodium.*—Potio Riveri; River's Drink.

Citric Acid 150 gr., Bicarbonate of Sodium 200 gr., Water 16 fl.oz.

Dissolve the Citric Acid in the Water contained in a bottle, add the Bicarbonate of Sodium, dissolve it by agitation, and finally stopper the bottle.

Note.—This preparation should be freshly made when wanted for use. (*N. F. C.*)

251. Liquor Sodii Tartaro-Citratis.—*Solution of Tartaro-Citrate of Sodium.*

Bicarbonate of Sodium 390 gr., Tartaric Acid a suff. quant., Citric Acid 30 gr., Syrup 1½ fl.oz., Water 10½ fl.oz.

Dissolve 360 gr. of the Bicarbonate of Sodium in the Water; add 360 gr. of Tartaric Acid, or a slight excess. Filter, and add the Syrup. Lastly, introduce the Citric Acid and the remaining 30 gr. of Bicarbonate of Sodium, and bottle immediately and securely. (*D. C.*)

252. Liquor Strychninæ.—*Solution of Strychnine.*

Strychnine (Alkaloid) 8 gr., Acetic Acid, U. S. P., 8 min., Alcohol 2 fl.dr., Water 6 fl.dr.

Dissolve and filter. Each fl.dr. contains 1 gr. of Strychnine. (*Pa.*)

253. Look Album.*—*White Drink.*—Emulsio Amygdalæ; Emulsion of Almonds; White Linctus.

Sweet Almonds 1 tr.oz., Bitter Almonds 30 gr., Sugar in coarse powder 1 tr.oz., Tragacanth in fine powder 8 gr., Orange Flower Water 3 fl.dr., Distilled Water 4 fl.oz.

Make an emulsion with the Almonds, 4 fl.oz. of the Water, and nearly the whole of the Sugar, and strain. Triturate the Tragacanth with the rest of the Sugar, and then incorporate with it a small quantity of the

emulsion. Triturate briskly and for a long time. Then add the rest of the emulsion in small portions, while continuing the trituration, and finally add the Orange Flower Water.

254. Lotio Adstringens.*—*Astringent Lotion*.—Warren's Styptic.

Sulphuric Acid 5 fl.dr., Oil of Turpentine, Alcohol, each 4 fl.dr.

To the Acid contained in a wedgewood mortar, slowly add the Oil of Turpentine, in small portions at a time, constantly stirring. Afterwards add the Alcohol in the same manner, and continue stirring until no more fumes arise. When cold, pour the mixture into a glass-stoppered bottle.

Note.—In preparing this mixture, caution should be used, and the temperature not allowed to rise too high. Still more care is to be observed, if a larger volume of the mixture is to be prepared. It is preferable in this case to prepare the mixture in several portions. (*N. F. C.*)

255. Lotio Flava.*—*Yellow Wash*.—Aqua Phagedænica Flava.

Corrosive Chloride of Mercury 24 gr., Water a suff. quant., Solution of Lime enough to make 16 fl.oz.

Dissolve the Corrosive Chloride of Mercury in 4 fl.dr. of boiling Water, and add the Solution to enough Solution of Lime, with agitation, to produce 16 fl.oz. of product. (*N. F. C.*)

Note.—Usual strength is 1 in 300.

256. Lotio Nigra.*—*Black Wash*.—Aqua Phagedænica Nigra.

Mild Chloride of Mercury 64 gr., Water a sufficient quantity, Solution of Lime enough to make 16 fl.oz.

Triturate the Mild Chloride of Mercury with about 4 fl.dr. of Water, and afterwards gradually add the Solution of Lime until 16 fl.oz. of product are obtained. (*N. F. C.*)

257. Lotio Plumbi et Opii.*—*Lead and Opium Lotion*.—Lead and Opium Wash.

Acetate of Lead 120 gr., Tincture of Opium $\frac{1}{2}$ fl.oz., Water enough to make 16 fl.oz.

Dissolve and mix. (*N. F. C.*)

258. Mistura Acaciæ.*—*Mixture of Acacia*.—Mistura Gummosa.

Acacia, Sugar, each 1 tr.oz., Water 12 fl.oz.

Dissolve. (*N. F. C.*, from *Pharm. Germ.*, I.)

259. Mistura Adstringens et Escharotica.*—*Astringent and Caustic Mixture*.—Villatte's Solution.

Solution of Subacetate of Lead $1\frac{1}{2}$ fl.oz., Sulphate of Copper, Sulphate of Zinc, each 420 gr., Diluted Acetic Acid $12\frac{1}{4}$ fl.oz.

Dissolve and mix. (*N. F. C.*)

260. Mistura Ammonii Chloridi.*—*Mixture of Ammonium Chloride*.—Mistura Solvens Simplex.

Chloride of Ammonium, Purified Extract of Liquorice, each 180 gr., Water 16 fl.oz.

Dissolve and mix. (*N. F. C.*)

261. Mistura Ammonii Chloridi Stibiata.*—*Mixture of Chloride of Ammonium with Tartar Emetic.*—Mistura Solvens Stibiata.

Chloride of Ammonium, Purified Extract of Liquorice, each 180 gr., Tartrate of Antimony and Potassium 2 gr., Water 16 fl.oz.

Dissolve and mix. (*N. F. C.*)

262. Mistura Balsamica.*—*Balsamic Mixture.*—Mistura Oleoso-Balsamica; Balsamum Vitæ Hoffmanni; Hoffmann's Balsam of Life.

Oil of Lavender 30 min., Oil of Cloves, Oil of Cinnamon, each 25 min., Oil of Thyme, Oil of Lemon, Oil of Mace, Oil of Orange Flowers, each 30 min., Balsam of Peru 80 min., Alcohol enough to make 16 fl.oz.

Mix and dissolve. (*N. F. C.*, from *Ph. Germ.*)

263. Mistura Camphoræ Acidæ.*—*Acid Camphor Mixture.*—Mistura Antidysenterica; Hope's Camphor Mixture.

Nitric Acid 120 min., Tincture of Opium 80 min., Camphor Water 16 fl.oz.

Mix them. (*N. F. C.*)

264. Mistura Camphoræ, Parrish.—*Parrish's Camphor Mixture.*

Camphor Water 3 fl.oz., Compound Tincture of Lavender 1 fl.oz., Sugar 60 gr.

Dissolve the Sugar in the Camphor Water, and add the Compound Tincture of Lavender. (*D. C.*)

265. Mistura Carminativa.*—*Carminative Mixture.*—Dalby's Cauminative.

Carbonate of Magnesium $1\frac{1}{4}$ tr.oz., Carbonate of Potassium 24 grs., Sugar $3\frac{1}{4}$ tr.oz., Tincture of Opium (U. S. Ph., 1880) 200 min., Oil of Caraway 2 min., Oil of Fennel, Oil of Peppermint, each 2 min., Water 16 fl.oz.

Triturate the Oils with about 1 dr. of the Carbonate of Magnesium and the Water gradually added. Introduce the liquid into a bottle, add the remainder of the Carbonate of Magnesium and the other ingredients, and shake until the Sugar is dissolved.

This preparation should be freshly made when required, and should be shaken before being dispensed.

Each fl.oz, represents about 1 gr. of Opium. (*N. F. C.*)

266. Mistura Copaibæ Composita.*—*Compound Copaiba Mixture.*—Lafayette Mixture.

Copaiba, Spirit of Nitrous Ether, Compound Tincture of Lavender, each 2 fl.oz., Solution of Potassa 4 fl.dr., Syrup 5 fl.oz., Mucilage of Acacia enough to make 16 fl.oz.

Mix the Copaiba first with the Solution of Potassa, then add the Spirit of Nitrous Ether and the Compound Tincture of Lavender; mix the liquid with the Syrup, and finally with enough Mucilage, under active stirring, to make 16 fl.oz.

The mixture should be well shaken before it is dispensed. (*N. F. C.*)

267. Misturæ Contra Diarrhœam.*—*Diarrhœa or "Cholera" Mixtures.*

1. *Sun Cholera Mixture.*

Tincture of Opium, Tincture of Capsicum, Tincture of Rhubarb, Spirit of Peppermint, Spirit of Camphor, each 1 fl.oz.

2. *Velpeau's Diarrhœa Mixture.*

Tincture of Opium, Compound Tincture of Catechu, Spirit of Camphor, each 1 fl.oz.

3. *Hamlin's Cholera Remedy.*

I. Tincture of Opium, Tincture of Rhubarb, Spirit of Camphor, each 1 fl.oz.

II. Tincture of Opium, Tincture of Cardamom, Tincture of Ginger, Tincture of Capsicum, each 1 fl.oz. (To be used in second stage, when collapse threatens.)

4. *Squibb's Diarrhœa Mixture.*

Tincture of Opium, Tincture of Capsicum, Spirit of Camphor, each 1 fl.oz., Purified Chloroform 3 fl.dr., Alcohol enough to make 5 fl.oz.

Note.—This mixture has been introduced, and is still sold under the title "Compound Tincture of Opium." It is the conviction of the Committee, and of every one whom they have consulted in the matter, that this title ought to be abandoned, as it is very apt, when abbreviated either in its English form or in its Latin equivalent ("Comp. Tinct. Opium," "Tinct. Opii Comp."), to lead to confusion, cases having actually occurred when it was dispensed in place of "Tinct. Opii Camph."—If a Latin title is required for it, it might be called "Tinctura Opii et Chloroformi Composita."

5. *Loomis' Diarrhœa Mixture.*

Tincture of Opium, Tincture of Rhubarb, each 4 fl.dr., Compound Tincture of Lavender 2 fl.oz., Oil of Sassafras 40 drops.

Note.—The directions given are: "Take a fl.dr. after each movement. Should the above mixture fail to act, add to it 1 fl.oz. of Tincture of Catechu." (*N. F. C.*)

268. *Mistura Expectorans, Stokes.*—Stokes' Expectorant Mixture.*

Carbonate of Ammonium 128 gr., Fluid Extract of Senega, Fluid Extract of Squill, each 4 fl.dr., Camphorated Tincture of Opium 3 fl.oz., Water 1½ fl.oz., Syrup of Tolu enough to make 16 fl.oz.

Dissolve the Carbonate of Ammonium in the Water, and mix the solution with the other ingredients. The mixture should be well shaken before being dispensed. (*N. F. C.*)

269. *Mistura Guaiaci.*—Mixture of Guaiac.*

Resin of Guaiac in powder, Sugar in coarse powder, each 190 gr., Acacia in fine powder 100 gr., Cinnamon Water 16 fl.oz.

Triturate the Guaiac with the Sugar and the Acacia, adding gradually the Cinnamon Water. (*N. F. C.*, from *Brit. Pharm.*)

270. *Mistura Rhei Composita.*—Compound Rhubarb Mixture (Squibb).*

Fluid Extract of Rhubarb 128 min., Fluid Extract of Ipecac 25 min., Bicarbonate of Sodium 256 gr., Glycerin 6 fl.oz., Peppermint Water enough to make 16 fl.oz.

Dissolve the Bicarbonate of Sodium in 8 fl.oz. of Peppermint Water, then add the Fluid Extracts, and lastly enough Peppermint Water to make 16 fl.oz.

271. *Mistura Sassafras et Opii.*—Mixture of Sassafras and Opium.—Mistura Opii Alkalina; Godfrey's Cordial.*

Carbonate of Potassium 60 gr., Oil of Sassafras 6 min., Tincture of Opium 256 min., Alcohol 360 min., Molasses 5 fl.oz., Water enough to make 16 fl.oz.

Dissolve and mix. Each fl.dr. contains 2 min. of Tincture of Opium. (*N. F. C.*)

272. Mistura Sodæ et Menthæ.*—Soda Mint.

Bicarbonate of Sodium 320 gr., Aromatic Spirit of Ammonia 1 fl.dr., Spearmint Water enough to make 16 fl.oz.

Dissolve and mix. (*N. F. C.* and *D. C.*)

273. Mistura Splenetica.*—Spleen Mixture (Gadberry's).

Sulphate of Iron, Sulphate of Quinine, each 100 gr., Nitric Acid 100 min., Nitrate of Potassium 300 gr., Water enough to make 16 fl.oz.

Dissolve and mix.

274. Mistura Sulphurica Acida.*—Sulphuric Acid Mixture.—Mistura Sulphurica Acida; Haller's Acid Elixir.

Sulphuric Acid 1 fl. dr., Alcohol 6 fl.dr.

Add the Acid gradually to the Alcohol, taking care that the temperature do not rise above 50° C. (122° F.). (*N. F. C.*, from *Ph. Germ.*)

275. Mucilago Salep.*—Mucilage of Salep.

Salep in fine powder 70 gr., Water 1½ fl.oz., Boiling Water 14½ fl.oz.

Shake the powdered Salep in a flask containing 1½ fl.oz. of Water until the powder is well divided. Then add the 14½ fl.oz. of Boiling Water and shake the mixture continuously until it has cooled to 25° C. (77° F.) or below this temperature. The cooling may be hastened by frequent and brief immersion of the flask in cold water.

Mucilage of Salep should be freshly made when wanted for use.

Note.—If sugar or syrup is prescribed in the same mixture with Mucilage of Salep, it is preferable first to triturate with them the Salep, and then to add rapidly the Boiling Water. (*N. F. C.*, after *Ph. Germ.*)

276. Olea Infusa.*—Infused Oils.

General Formula.—The Dry Herb in powder 10 p., Alcohol 8 p., Lard Oil, Cotton Seed Oil, each 50 p.

Mix the powdered Herb with the Alcohol, in a stone vessel of suitable capacity, cover it well, and macerate for 24 hours. Then add 60 p. of the mixed Oils, digest, under frequent agitation, during 10 or 12 hours, at a temperature between 60° and 70° C. (140° to 158° F.), and express strongly. To the residue add the remainder of the Oils, digest and express in the same manner, and unite the expressed portions. (*N. F. C.*)

277. Oleosacchara.*—Oil Sugars.—Elæosacchara.

Any Volatile Oil 1 drop, Sugar in coarse powder 30 gr.

Triturate the Sugar with the Oil to a fine powder.

Note.—This preparation should be freshly made when wanted for use. (*N. F. C.*, after *Pharm. Germ.*)

278. Oleum Hyoscyami Compositum.*—*Compound Oil of Hyoscyamus.*—Balsamum Tranquillans; Baume Tranquille.

Infused Oil of Hyoscyamus 5 fl.oz., Oil of Absinth, Oil of Lavender, Oil of Rosemary, Oil of Sage, Oil of Thyme, each 3 drops.

Mix them.

279. Oxymel Scillæ.*—*Oxymel of Squill.*

Vinegar of Squill 9 fl.oz., Honey 16 av.oz.

Mix them in a tared porcelain capsule or enamelled vessel, and evaporate over a water-bath until the weight of the mixture is reduced to 20½ av.oz. Then allow it to cool, and transfer to bottles, which should be well corked.

Note.—The sp. gr. of this preparation is about 1.320. (*N. F. C.*)

280. Pancreatinum.*—*Pancreatin.*

Reduce the fresh Pancreas of the hog, previously freed as much as possible from the fat and membranes, to a fine paste by means of a suitable chopping machine. Mix it with half its weight of cold Water saturated with Chloroform, and knead it thoroughly and frequently during one hour; then transfer the mass to a strainer and express it forcibly. Saturate the liquid with Chloroform, to preserve it, and filter it, as quickly as possible, through Canton flannel. Then add to the filtrate an equal volume of Alcohol, so that the Pancreatin may be precipitated. Collect the precipitate, drain and express it. Then mix it with the Water to a moderately thin paste, spread this in thin layers upon plates of glass or porcelain, and dry it by exposure to a current of warm air, which should not exceed the temperature of 40° C. (104° F.) (*N. F. C.*)

281. Pepsinum Aromaticum.*—*Aromatic Pepsin.*

Saccharated Pepsin 480 gr., Aromatic Fluid Extract (U. S. Ph.) ½ fl.oz., Tartaric Acid, Chloride of Sodium, each 8 gr.

Mix them by trituration, and dry the mixture by exposure to warm air. Keep the product in well-stoppered bottles. (*N. F. C.*)

282. Pepsinum Saccharatum.—*Saccharated Pepsin.*

Note.—"A working formula for preparing this from pure pepsin is wanted." (*Wis.*)

283. Pilulæ Metallorum Amaræ.—*Bitter Metallic Pills.*

Sulphate of Quinine, Reduced Iron, each 60 gr., Strychnine, Arsenious Acid, each 3 gr.

Mix thoroughly and make 60 pills. (*D. C.*)

284. Pilula Triplex.*—*Triplex Pill.*

Aqueous Extract of Aloes, Scammony in fine powder, Mass of Mercury, each 200 gr.

Mix and divide into 40 pills. (*N. F. C.*)

285. Pilulæ Ferri Carbonatis, Blaud.*—*Blaud's Pills of Carbonate of Iron.*—Blaud's, or Ferruginous Pills.

Sulphate of Iron in crystals 240 gr., Carbonate of Potassium 140 gr., Sugar, Acacia in fine powder, Starch, each 30 gr.

Triturate the Sulphate of Iron and the Carbonate of Potassium in a wedgewood mortar until they are mixed, then add the Sugar and Acacia, and continue the trituration until the mixture becomes a homogeneous mass, and the whole of the Iron salt is decomposed. Finally add the Starch, and make 96 pills.

Note.—In place of Starch, powdered Althæa or Glycyrrhiza may be used. (*N. F. C.*)

286. Pilulæ Podophylli, Squibb.*—*Squibb's Podophyllum or Laxative Pills.*

Resin of Podophyllum 6 gr., Alcoholic Extract of Belladonna 3 gr., Capsicum in No. 30 powder 12 gr., Sugar of Milk in fine powder 24 gr., Acacia in fine powder 6 gr., Glycerin, Syrup, each q. s.

Mix, and make 24 pills. Expose them to the air until they are just dry enough, then transfer them to well-closed bottles. (*N. F. C.*)

287. Pilulæ Variæ.

Note.—There are many formulæ of pills, known by the names of their originators, or designated by titles indicating their constituents or implying their effects, which might be included in the National Formulary. An expression of opinion on this question, and eventually a list of such formulæ, is desired.

288. Pulvis Acaciæ Compositus.*—*Compound Powder of Acacia.*—Pulvis Gummosus.

Acacia in fine powder 15 p., Glycyrrhiza in fine powder 10 p., Sugar in fine powder 5 p.

Mix them. (*N. F. C.*, from *Ph. Germ.*)

289. Pulvis Aloes et Canellæ.*—*Powder of Aloes and Canella.*—Hiera Picra.

Aloes in fine powder 4 p., Canella in fine powder 1 p.

Mix them intimately. (*N. F. C.*)

290. Pulvis Amygdalæ Compositus.*—*Compound Powder of Almond.*

Sweet Almonds 8 p., Sugar in fine powder 4 p., Acacia in fine powder 1 p.

Blanch the Almonds, then dry them thoroughly with a soft cloth, and rub them lightly in a mortar to a smooth consistence. Mix the Gum and the Sugar, and, adding them to the Almond pulp gradually, rub the whole to a coarse powder. Keep it in a lightly covered jar. (*N. F. C.*, from *Brit. Ph.*)

291. Pulvis Anticatatrrhalis.—*Catarrh Snuff.*

Hydrochlorate of Morphine 1 gr., Acacia in fine powder 60 gr., Subnitrate of Bismuth 180 gr.

Mix them intimately by trituration. (*D. C.*)

292. Pulvis Arsenicalis Cosmi.*—*Côme's Arsenical Powder.*

Red Sulphide of Mercury 30 p., Arsenious Acid 10 p., Dragon's Blood 3 p., Animal Charcoal 2 p.

Triturate them together to a very fine powder.

293. Pulvis Catechu Compositus.*—*Compound Powder of Catechu.*

Catechu in fine powder 4 p., Kino in fine powder, Krameria in fine powder, each 2 p., Cinnamon in fine powder, Nutmeg in fine powder, each 1 p.

Mix them. (*N. F. C.*, from *Brit. Ph.*)

294. Pulvis Cretæ Aromaticus.*—*Aromatic Powder of Chalk.*

Cinnamon 4 p., Saffron, Nutmeg, each 3 p., Cloves 1½ p., Cardamom 1 p., Sugar 25 p., Chalk 11 p.

Mix the ingredients and reduce them to a fine powder. (*N. F. C.*, from *Brit. Ph.*)

295. Pulvis Cretæ Aromaticus cum Opio.*—*Aromatic Powder of Chalk and Opium.*

Aromatic Powder of Chalk 39 p., Powdered Opium 1 p.

Mix them. (*N. F. C.*, from *Brit. Ph.*)

296. Pulvis Hydrargyri Chloridi Mitis et Jalapæ.*—*Powder of Calomel and Jalap.*—"Calomel and Jalap."

Mild Chloride of Mercury 10 gr., Jalap in fine powder 20 gr.

Mix them. When "Calomel and Jalap" is prescribed for an adult without any proportions being specified, the above mixture is to be dispensed as one dose. (*N. F. C.*)

297. Pulvis Iodoformi et Naphthalini.*—*Iodoform and Naphthalin.*

Iodoform, Naphthalin, each 1 av.oz., Oil of Bergamot 10 min.

Triturate the Oil of Bergamot first with the Naphthalin, and then incorporate the Iodoform. (*N. F. C.*)

298. Pulvis Kino Compositus.*—*Compound Powder of Kino.*

Kino in fine powder 15 p., Opium in fine powder 1 p., Cinnamon in fine powder 4 p.

Mix them. (*N. F. C.*, from *Brit. Ph.*)

299. Pulvis Myricæ Compositus.*—*Compound Powder of Bayberry.*—Composition Powder (Thomsonian Name).

Bayberry Root Bark (*Myrica cerifera*) 12 p., Ginger 6 p., Capsicum, Cloves, each 1 p.

Reduce the substances to a moderately fine powder. (*N. F. C.*)

300. Pulvis Pancreaticus Compositus.*—*Compound Pancreatic Powder.*

Extract of Pancreas, 5 gr., Bicarbonate of Sodium, 15 gr.

Mix by trituration.

Directions for Use.—Dissolve the powder in 8 fl.oz. of cold water, add 8 fl.oz. of fresh milk, and allow the mixture to stand in a warm place, or in warm water, at a temperature

of about 100° F., for fifteen minutes. Then put it into a cold place. The peptonization of the milk should be stopped before the latter acquires a bitter taste. (*N. F. C.*)

301. Pulvis Pepsini Compositus.*—*Compound Powder of Pepsin.*—Pulvis Digestivus.

Saccharated Pepsin, Pancreatin (undiluted), each 15 p., Diastase (Ptyalin), Lactic Acid (U. S. Ph.), each 1 p., Hydrochloric Acid 2½ p., Sugar of Milk 65½ p.=100 p.

To the Sugar of Milk add the Acid gradually, and triturate until a uniform mixture is produced. After having mixed the Diastase with the Pepsin and Pancreatin, incorporate them with the aid of Sugar of Milk. Finally rub the mixture through a sieve, and preserve the powder in bottles.

Note.—The pancreatin used in this preparation should be that obtained from the hog. (*N. F. C.*, from *III.*)

302. Pulvis Rhei et Magnesiae.—*Powder of Rhubarb and Magnesia.*—Compound Anise Powder.

Heavy Calcined Magnesia 360 gr., Rhubarb in fine powder 180 gr., Oil of Anise 40 min., Stronger Alcohol 1 fl.dr.

Mix the Powders, add the Oil of Anise, previously dissolved in the Alcohol, and triturate until thoroughly mixed. (*D. C.*)

303. Pulvis Talcı Salicylicus.*—*Salicylic Powder of Talc.*

Salicylic Acid 3 p., Boric Acid 10 p., Talc 87 p.

Mix them by trituration.

Note.—The corresponding preparation of the German Pharm. contains starch in place of Boric Acid. (*N. F. C.*)

304. Sal Carolinum Factitium.*—*Artificial Carlsbad Salt.*

I.* *In powder form.*—Sulphate of Potassium in fine powder 2 p., Chloride of Sodium in fine powder 18 p., Bicarbonate of Sodium in fine powder 36 p., Sulphate of Sodium, dried, 44 p.

Mix them intimately. (*N. F. C.*, after *Pharm. Germ.*)

Note.—The dried Sulphate of Sodium of the *Germ. Pharm.* is prepared by slowly drying the crystallized salt until it has lost one-half its weight.

II.* *In crystalline form.*—Sulphate of Potassium 2 p., Chloride of Sodium 18 p., Carbonate of Sodium in clear crystals 61 p., Sulphate of Sodium, crystallized, 88 p.

Dissolve the Sulphate of Potassium and Chloride of Sodium in 50 p. of Water, and add this solution to the other two salts previously melted at a gentle heat, in a tared capsule, in their own water of crystallization. Evaporate the mixture to about 180 p., set it aside in a cool place, and stir frequently so as to prevent the formation of large crystals, taking care that none of the salt separates in a pulverulent form. Distribute any remaining water of crystallization uniformly over the crystals, and dry the whole mixture sufficiently by exposure to air, so that it will retain its crystalline character. (*N. F. C.*)

305. Sapo Arsenicalis.*—Arsenical Soap.

Arsenious Acid in fine powder 320 gr., Carbonate of Potassium 120 gr., Castile Soap 320 gr., Lime 40 gr., Camphor 10 gr., Water q. s.

Heat the Arsenious Acid and Carbonate of Potassium with 1 fl.oz. of Water in a porcelain capsule, until the Arsenious Acid is completely dissolved. Then add the Castile Soap, in thin shavings, and after this has been thoroughly incorporated, the Camphor and the Lime previously reduced to powder. Keep the product in well-closed vessels.

Note.—This Arsenical Soap is primarily intended for use by taxidermists.

306. Sapo Viridis.—Green Soap.

Potassa 1 p., Cotton Seed Oil 3 p., Water enough to make 10 p.

Dissolve the Potassa in 2 p. of Water, and, while stirring the solution, add the Cotton Seed Oil. Stir it occasionally during forty-eight hours, then add enough Water to make 10 p. (*D. C.*)

307. Soda cum Calce.*—Soda with Lime.—London Paste.

Soda, Lime, each equal p.

Reduce them to powder in a clean iron mortar, previously warmed, and mix them intimately. Keep the powder in small vials which are preferably closed with rubber stoppers. (*N. F. C.*)

308. Sodii Boro-Benzoas.*—Boro-Benzoate of Sodium.

Biborate of Sodium 3 p., Benzoate of Sodium 4 p.

Mix them.

309. Species Emollientes.*—Emollient Species.

Althæa Leaves, Mallow Leaves, Melilot Leaves, Matricaria, Flaxseed, each 1 p.

Reduce them to a coarse powder and mix. (*N. F. C.*, from *Ph. Germ.*)

310. Species Laxantes.*—Laxative Species.—St. Germain Tea.

Senna (Alexandria) 16 p., Elder Flowers 10 p., Fennel, Anise, each 5 p., Bitartrate of Potassium 3 p.

Cut, bruise and mix the vegetable substances. When the Species are to be dispensed, add the Bitartrate of Potassium.

Note.—To prepare 1 tr.oz. of the Species, take Senna 200, Elder Flowers 120, Fennel, Anise, each 60, and Bitartrate of Potassium 40 gr. (*N. F. C.*, after *Ph. Germ.*)

311. Species Pectorales.*—Pectoral Species.—German Breast Tea.

Althæa, peeled, 8 p., Glycyrrhiza, Russian, peeled, 3 p., Orris Root 1 p., Coltsfoot 4 p., Mullein Flowers, Anise, each 2 p.

Cut, bruise and mix them.

Note.—To prepare 1 tr.oz. of the Species, take Althæa 192, Glycyrrhiza 72, Orris Root 24, Coltsfoot 96, Mullein 48, Anise 48 gr. Cut, bruise and mix them. (*N. F. C.*, after *Ph. Germ.*)

312. Spiritus Acidi Formici.*—*Spirit of Formic Acid.*—*Spiritus Formicarum*; Spirit of Ants.

Formic Acid (sp. gr. 1.060–1.063) 250 min., Water $3\frac{1}{2}$ fl.oz., Alcohol enough to make 16 fl.oz.

Mix them. (*N. F. C.*, after *Ph. Germ.*)

313. Spiritus Amygdalæ Amaræ.*—*Spirit of Bitter Almond.*

Oil of Bitter Almond 160 min., Alcohol 14 fl.oz., Distilled Water enough to make 16 fl.oz.

Dissolve the Oil in the Alcohol, and add enough Distilled Water to make 16 fl.oz. (*N. F. C.*)

314. Spiritus Aromaticus.*—*Aromatic Spirit.*

I.* Orange Peel, fresh and deprived of the inner white portion, 16 av.oz., Lemon Peel fresh, Coriander bruised, each 2 av.oz., Oil of Staranise 16 min., Deodorized Alcohol, enough to make 1 gall.

Macerate the solids during four days with 1 gall. of Deodorized Alcohol; then add the Oil of Staranise, filter, and pass enough Deodorized Alcohol through the filter to make the product measure 1 gallon.

II.* *Aromatic Spirit* may also be prepared as follows: Compound Spirit of Orange 8 fl.oz., Deodorized Alcohol enough to make 1 gall.

Mix them. Keep the product in completely filled and well-stoppered vials or bottles, laid on their sides and kept in a cool and dark place.

Note 1.—Whenever practicable, the first of the above-mentioned formulæ should be followed. When the quantity of Aromatic Spirit to be prepared at one time is so large that it becomes inconvenient to separate the peel from fresh oranges and lemons, the second formula may be substituted. The product prepared by the second formula should always be used when preparations of Iron form any of the constituents of a mixture. (I and II, *N. Y. & B.*, revised. *N. F. C.*)

Note 2.—The increase in Orange Peel, in form. I, was recommended by *M.* The Oil of *bitter* (instead of *sweet*) Orange has been chosen for the Comp. Spirit of Orange in form. II, as it is believed to keep better and is generally obtainable of better quality than the other.

315. Spiritus Aurantii.—*Spirit of Orange.*

I. Oil of Orange 1 fl.oz., Alcohol 9 fl.oz.

Mix them, and preserve the solution in small, entirely filled, and well-stoppered vials, laid on their sides and kept in a cool and dark place. (*Ky.*)

Note.—The *Ky.* directs Spirit of Cinnamon, Cloves, Anise, and Bitter Almond to be prepared in the same manner.

II.* A general formula for alcoholic solutions of essential oils is proposed under No. 319.

316. Spiritus Aurantii Compositus.*—*Compound Spirit of Orange.*

Oil of Bitter Orange Peel 4 fl.oz., Oil of Lemon 1 fl.oz., Oil of Coriander 160 min., Oil of Staranise 40 min., Deodorized Alcohol enough to make 20 fl.oz.

Mix them. 1 fl.oz. of this solution and 15 fl.oz. of Deodorized Alcohol make 1 pint of Aromatic Spirit. (No. 314, II).

Note.—Both the Oil of Orange and the Oil of Lemon must be absolutely free from terebinthinate odor and taste. Both oils should be procured only from the most reliable source, and, as soon as received, diluted with a definite quantity of Deodorized Alcohol, which will retard deterioration. Neither oil should be kept in stock for any length of time, or should at least be kept in bottles completely filled, and in a dark place. It is also advisable to coat the corks used for stoppering the vials with a melted mixture of gelatin and glycerin, and to seal the tops of the corks with the same mixture. The same precautions ought to be observed with the alcoholic solutions. If Oil of Curaçao Orange can be obtained, it is advisable to use this, in place of ordinary Oil of Orange, as it imparts to the Spirit a much finer flavor than the latter. (*N. Y. & B.*, revised. *N. F. C.*)

317. **Spiritus Cardamomi Compositus.***—*Compound Spirit of Cardamom.*

Oil of Cardamom 30 drops, Oil of Caraway 10 drops, Oil of Cinnamon (Cassia) 4 drops, Glycerin 2 fl.oz., Alcohol 22 fl.oz., Water 18 fl.oz.

Note.—The above solution is to be used as a flavoring ingredient, being a substitute for the official *Tinctura Cardamomi Composita*, without the coloring matter. (*N. Y. & B.*, unaltered. *N. F. C.*)

318. **Spiritus Curassao.***—*Spirit of Curaçao.*

Oil of Curaçao Orange 2 fl.oz., Oil of Fennel ("sweet") 15 min., Oil of Bitter Almond 3 min., Deodorized Alcohol 10 fl.oz.

Mix the Oils (which should be absolutely free from terebinthinate odor and taste) with the Deodorized Alcohol, and keep the Spirit in completely filled and well-corked bottles, which should be laid on their sides and kept in a cool and dark place. (*N. Y. & B.*, revised. *N. F. C.*)

319. **Spiritus Oleorum Volatilium.***—*Spirits (or Alcoholic Solutions) of Essential Oils.*

General Formula.—Any spirit or alcoholic solution of an essential oil, for which no formula is given by the U. S. Pharm. or this Formulary, should be prepared in accordance with the following general formula:

Any Volatile Oil 380 min., Deodorized Alcohol enough to make 16 fl.oz.

The strength of a spirit thus prepared is about 5 per cent. (*N. F. C.*)

320. **Spiritus Ophthalmicus.***—*Alcoholic Eye-wash.*

Oil of Lavender 10 min., Oil of Rosemary 30 min., Alcohol 1 fl.oz.

Mix them by agitation, and if necessary, filter through paper. (*N. F. C.*)

321. **Spiritus Phosphori.***—*Spirit of Phosphorus.*—Tincture of Phosphorus.

I.* Phosphorus 10 gr., Absolute Alcohol, enough to make 15 fl.oz.

To the Absolute Alcohol, contained in a flask, add the Phosphorus (which should be in clean, transparent fragments), and dissolve it by applying the heat of a water-bath, taking care that the volume of Absolute Alcohol be preserved, as nearly as possible, until solution is effected. When cold, add enough Absolute Alcohol to make 15 fl.oz. Keep the Spirit in a cool and dark place, remote from lights or fire.

Each fl.dr. contains $\frac{1}{12}$ gr. of Phosphorus; 14.4 min. contain $\frac{1}{30}$ gr. of Phosphorus.

Note.—The loss of alcohol, during the heating, may be avoided, and solution effected

more expeditiously, by attaching to the flask a well-cooled, upright condenser, which will cause the vapor of the alcohol to be condensed, and to flow back into the flask.

This Spirit of Phosphorus is intended for preparing the Elixir of Phosphorus. It is unsuited for internal administration without corrigents. It should not be confounded with Thompson's Solution of Phosphorus (see under *Liquor Phosphori, Thompson*). (*N. Y. & B.*, revised. *N. F. C.*)

II. Phosphorus about 60 gr., Alcohol, Distilled Water, each a sufficient quantity.

Place the Phosphorus into a two-ounce vial, fill the vial with Distilled Water, cork well, and place in a water-bath until the Phosphorus has melted. Then shake the vial vigorously until the contents have become cooled to the ordinary temperature. Allow the powdered Phosphorus to subside, decant the supernatant water, and wash the Phosphorus with Alcohol to remove adhering water; transfer the powdered Phosphorus to a pint bottle filled with Alcohol, and agitate this frequently during forty-eight hours. The tincture is decanted from the Phosphorus as may be required. It is advisable to shake the bottle occasionally, so as to insure a saturated solution of Phosphorus. (*Ky.*)

Note.—The *Ky.* entitles this “*Tinctura Phosphori.*”

322. *Spiritus Saponatus*.*—*Spirit of Soap.*

Castile Soap in shavings 2½ tr.oz., Alcohol 9 fl.oz., Hot Water, enough to make 16 fl.oz.

Introduce the Soap into a bottle, add the Alcohol and 3 fl.oz. of Water, cork the bottle and immerse it in hot water, frequently shaking. When the soap is dissolved, allow to cool, add enough Water to make 16 fl.oz., and filter.

Note.—The *Spiritus Saponatus* of the *Germ. Pharm.* is prepared by saponifying Olive Oil with Potassa and then adding Alcohol and Water. If time permits, the Spirit ought to be set aside, in a moderately cool place, for about 12 hours, before being filtered. (*N. F. C.*)

323. *Spiritus Sinapis*.*—*Spirit of Mustard.*

Volatile Oil of Mustard 190 min., Alcohol enough to make 16 fl.oz.

Mix them. (*N. F. C.*, after *Ph. Germ.*)

324. *Spongix Compressæ*.*—*Compressed Sponge.*—Sponge Tents.

Sponge, Mucilage of Acacia, each a sufficient quantity.

Cut fine Sponge, previously freed from sand and other obvious impurities, into suitable pieces, dip them into a hot mixture of 1 volume of Mucilage of Acacia and 9 volumes of Water, firmly wrap twine around them so as to bring them to the shape desired, and dry them.

Sponge Tents may be preserved with the twine wrapped around them. If the twine is removed, special care must be taken to protect them against dampness. (*N. F. C.*)

325. *Spongix Decoloratæ*.*—*Decolorized Sponge.*—Bleached Sponge.

Sponge, previously deprived of sand and other foreign matters by beating and wash-

ing, Permanganate of Potassium, Hyposulphite of Sodium, Oxalic Acid, Water, each a sufficient quantity.

Soak the Sponges in a 1 per cent. solution of Permanganate of Potassium for about fifteen minutes, wringing them out occasionally, and replacing them in the liquid. Then remove them, and wash them with Water, until the latter runs off colorless. Wring them out forcibly, and then place them into a solution of Hyposulphite of Sodium, containing $\frac{1}{2}$ lb. in 1 gall., to which 1 av.oz. of Oxalic Acid, dissolved in just sufficient cold Water, had been added just previous to the immersion of the Sponges. Work them about in this solution for about 15 minutes, then remove them, wash them thoroughly with cold Water, and dry them. In the case of large and strongly colored Sponges, this treatment may have to be repeated.*

Note.—If it is desired to keep the Sponges soft and to prevent them from shrinking when dried, they may be dipped, after being washed, into a mixture of 1 vol. of Glycerin and 4 vols. of Water, and then wrung out and laid aside to dry.

326. **Succus Limonum cum Pepsino.***—*Lime-juice and Pepsin.*

Pepsin dry and undiluted 256 gr., Water, Glycerin, each 3 fl.oz., Alcohol 1 $\frac{1}{2}$ fl.oz., Lime-juice enough to make 16 fl.oz.

Dissolve the Pepsin in the Water, add the Glycerin, then 8 fl.oz. of Lime-juice, then the Alcohol, and fill up with Lime-juice to obtain a pint.

327. **Syrupus Actææ Compositus.**—*Compound Syrup of Actæa.*

Fl. Ext. Cimicifuga 2 fl.oz., Fl. Ext. Senega 1 fl.oz., Fl. Ext. Ipecacuanha 4 fl.dr., Ext. Liquorice $\frac{1}{2}$ tr.oz., Wild Cherry Bark powd. 2 tr.oz., Water a sufficient quantity, Sugar 36 tr.oz.

Dissolve the Extract of Liquorice in 28 fl.oz. of Water, and mix the solution with the Fluid Extracts. Percolate the Powdered Wild Cherry Bark with the mixture, returning the percolate until it passes perfectly clear. Add through the percolator as much Water as may be required to obtain 28 fl.oz. of percolate. In this dissolve the Sugar, without heat, and strain if necessary. (*D. C.*)

328. **Syrupus Ammonii Chloridi.***—*Syrup of Chloride of Ammonium.*

Chloride of Ammonium 2 $\frac{1}{2}$ tr.oz., Sugar 10 tr.oz., Water enough to make 16 fl.oz.

Dissolve the Chloride of Ammonium in the Water, add the Sugar, and dissolve it by agitation. Strain, if necessary. (*N. F. C.*)

329. **Syrupus Asari Compositus.**—*Compound Syrup of Canada Snakeroot.*

Canada Snakeroot in No. 30 powder 1 tr.oz., Stronger Alcohol 3 fl.oz., Cochmeal in fine powder 10 gr., Carbonate of Potassium 20 gr., Wine of Ipecac $\frac{1}{2}$ fl.oz., Sugar 12 tr.oz., Water a sufficient quantity.

Mix the Alcohol with 6 fl.oz. of Water, macerate the Canada Snake-root in this menstruum during 24 hours, strain, percolate the tincture thus obtained through the Root, returning the percolate until it passes clear, and displace the menstruum retained by the powder with a suffi-

cient quantity of Water to make the liquid measure 9 fl.oz. To this add the Cochineal, Carbonate of Potassium, Wine and Sugar. Agitate the mixture until the Sugar is dissolved. (*D. C.*)

330. Syrupus Caffææ.*—Syrup of Coffee.

Coffee roasted and finely ground 8 av.oz., Sugar 24 av.oz., Boiling Water a suff. quant.

Pour Boiling Water, in successive portions, upon the Coffee packed tightly in a percolator, until 16 fl.oz. of percolate are obtained. In this dissolve the Sugar, by agitation, without heat.

Note.—It is recommended that a mixture of equal parts of the commercial varieties of Coffee, known as Mocha and Java, be employed for this preparation. The percolation should be conducted slowly, fresh portions of Boiling Water being poured on top, when the previous portion has disappeared from the surface, and the percolator should be covered during the operation. (*N. Y. & B.*, unaltered. *N. F. C.*)

331. Syrupus Calcii Chlorhydrophosphatis.*—Syrup of Chlorhydrophosphate of Calcium.

Precipitated Phosphate of Calcium 128 gr., Diluted Hydrochloric Acid (10%) 11 fl.dr., Spirit of Lemon 140 min., Syrup enough to make 16 fl.oz.

Triturate the Phosphate of Calcium with 2 fl.oz. of the Syrup, and dissolve it by means of the Diluted Hydrochloric Acid. Then add the Spirit of Lemon and enough Syrup to make 16 fl.oz. (*N. F. C.*)

331. Syrupus Calcii et Sodii Hypophosphitum.*—Syrup of Hypophosphite of Calcium and Sodium.

I.* Hypophosphite of Calcium, Hypophosphite of Sodium, each 256 gr., Citric Acid 10 gr., Sugar 12 av.oz., Water enough to make 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to Elixir Ammonii Bromidi.

II. Hypophosphite of Calcium, Hypophosphite of Sodium, each 256 gr., Hypophosphorous Acid, 50%, 2 fl.dr., Hot Water 3 fl.oz., Syrup enough to make 1 pint.

Dissolve the Hypophosphites with the aid of the Acid in the Hot Water by rubbing well in a porcelain mortar, then add enough Syrup to make the whole measure *one pint*. (*Pa.*)

332. Syrupus Calcii Hypophosphitis.*—Syrup of Hypophosphite of Calcium.

I.* Hypophosphite of Calcium 256 gr., Citric Acid 10 gr., Sugar 12 av.oz., Water enough to make 16 fl.oz. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to Elixir Ammonii Bromidi.

II. Hypophosphite of Calcium 256 gr., Hypophosphorous Acid, 50%, 2 fl. dr., Hot Water 3 fl.oz., Simple Syrup sufficient to make 1 pint.

Dissolve the Hypophosphite of Calcium in the Hot Water with the aid of the Acid, and add enough Syrup to make the whole measure *one pint*. (*Pa.*)

334. Syrupus Calcii Iodidi.*—Syrup of Iodide of Calcium.

Iodide of Calcium 640 gr., Water 2 fl.oz., Tincture of Vanilla 2 fl.dr., Syrup enough to make 16 fl.oz.

Dissolve the Iodide of Calcium in the Water, and add the other in-

gredients. Keep the syrup in small, full, well-stoppered vials, in a dark place.

Note.—If this preparation is to be kept in large quantities, it may be protected from change by pouring on its surface a layer of pure olive or other bland, fatty oil. (*N. F. C.*)

335. Syrupus Calcii Lactophosphatis cum Ferro.*—*Syrup of Lactophosphate of Calcium and Iron.*

Lactate of Iron, Citrate of Potassium, each 64 gr., Water 1 fl.oz., Syrup of Lactophosphate of Calcium enough to make 16 fl.oz.

Dissolve the Citrate of Potassium and the Lactate of Iron in the Water with the aid of heat, and add enough Syrup of Lactophosphate of Calcium to make the product measure 16 fl.oz.—Each fl.dr. contains $\frac{1}{2}$ gr. of Lactate of Iron, and about $\frac{1}{4}$ gr. of Lactate of Calcium. (*N. F. C.*)

336. Syrupus Chondri Compositus.—*Compound Syrup of Irish Moss (Carragheen).*

Fl. Ext. Ipecacuanha 60 min., Fl. Ext. Squill, Fl. Ext. Senega, each 2 fl.oz., Irish Moss 60 gr., Sugar 100 tr.oz., Camphorated Tincture of Opium $3\frac{1}{2}$ fl.oz., Water $3\frac{1}{2}$ pints.

Make a syrup with the Irish Moss (previously macerated in cold water), the Sugar, and the Water; strain, and add the Fluid Extracts. When cold, add the Camphorated Tincture of Opium. (*D. C.*)

337. Syrupus Cinnamomi.*—*Syrup of Cinnamon.*

Cinnamon in coarse powder $1\frac{1}{2}$ tr.oz., Alcohol 6 fl.dr., Sugar 12 tr.oz., Cinnamon Water enough to make 16 fl.oz.

Macerate the Cinnamon with the Alcohol and 7 fl.oz. of Cinnamon Water previously mixed, for two days; then strain and filter the strained liquid upon the Sugar contained in a bottle. Pass enough Cinnamon Water through the strainer and filter to make the product, after the Sugar is dissolved, measure 16 fl.oz. (*N. F. C.*)

338. Syrupus Eriodictyi Aromaticus.*—*Aromatic Syrup of Yerba Santa (Mountain Balm).*

I.* Fluid Extract of Eriodictyon $\frac{1}{2}$ fl.oz., Solution of Potassa 180 min., Compound Tincture of Cardamom 1 fl.oz., Oil of Sassafras, Oil of Lemon, each 2 min., Oil of Cloves 4 min., Alcohol $\frac{1}{2}$ fl.oz., Sugar 14 tr.oz., Water enough to make 16 fl.oz.

Mix the Fluid Extract and Solution of Potassa; then add $1\frac{1}{2}$ fl.oz. of Water previously mixed with the Compound Tincture of Cardamom, and lastly add the Alcohol holding the Oils in solution. Filter and pass enough Water through the filter to obtain 6 fl.oz. of filtrate. Pour this upon the Sugar contained in a bottle, and dissolve by placing the bottle in hot water, frequently agitating. (*N. F. C.*)

II. Eriodictyon 16 tr.oz., Bitter Orange Peel 6 dr., Cinnamon (Ceylon) $1\frac{1}{2}$ tr.oz., Cloves, Cardamom, Coriander, Anise, each 6 dr., Caraway 4 dr., Red Saunders, Wild Cherry, Glycyrrhiza, each 2 tr.oz., Glycerin 2 pints, Alcohol 16 fl.oz., Sugar 40 tr.oz., Water enough to make 8 pints.

Reduce the drugs to a moderately fine powder. Mix the Alcohol, the

Glycerin, and 1 pint of Water, and percolate the powder with this menstruum, in the usual manner, receiving the percolate into a bottle containing the Sugar. When the menstruum has disappeared, pour Water on top, until the syrupy solution in the bottle measures 8 pints. Filter, if necessary. (*D. C.*)

Note.—The *D. C.* entitles this “Compound Elixir of Yerba Santa.”

III. Mountain Balm 4 av.oz., Bicarbonate of Potassium 4 av.dr., Tincture of Cudbear 4 fl.dr., Alcohol 3 fl.oz., Sugar 28 av.oz., Water 3 pints, Oil of Cinnamon 12 min, Oil of Cloves, Oil of Aniseed, each 6 min., Oil of Coriander, Oil of Cardamom, each 4 min.

Boil the Mountain Balm with the Bicarbonate of Potassium in 3 pints of Water for half an hour and strain; evaporate the strained liquid to 12 fl.oz., and boil to a syrup with the Sugar; add the Tincture of Cudbear, dissolve the Oils in the Alcohol, and add 3 oz. of Water to the solution and 2 dr. of Talcum, and filter into the Syrup; mix all well together, to make 2 pints. (*Pa.*)

339. **Syrupus Ferri Arseniatis.***—*Syrup of Arseniate of Iron.*

Citrate of Iron 5 gr., Arseniate of Sodium, crystallized and dried to a constant weight at 100° C. (212° F.), 6 gr., Water ½ fl.oz., Syrup enough to make 32 fl.oz.

Dissolve both the Citrate of Iron and the Arseniate of Sodium in the Water, contained in a test-tube, by the aid of heat. Then mix the solution with enough Syrup to make 32 fl.oz.

Each fl.dr. contains about $\frac{1}{80}$ gr. of Arseniate of Iron ($\text{Fe}_2\text{AsO}_4 \cdot 4\text{H}_2\text{O}$).

Note.—Care must be taken to select well-formed crystals of Arseniate of Sodium, which must then be completely dried at 212° F. The 6 gr. must be weighed from the dried salt. A fresh quantity of the crystallized salt should be dried on purpose every time the above Syrup is to be prepared. (*N. F. C.*)

340. **Syrupus Ferri Chloridi.**—*Syrup of Ferrous Chloride.*

Solution of Ferrous Chloride 4½ fl.dr., Glycerin, Orange Flower Water, each 2 fl.oz., Syrup enough to make 1 pint.

Mix them. (*Pa.*)

341. **Syrupus Ferri Citro-Iodidi.***—*Syrup of Citro-Iodide of Iron.*—Tasteless Syrup of Iodide of Iron.

Iodine 42 p., Iron in the form of fine wire and cut 15 p., Citrate of Potassium 65 p., Sugar 500 p., Distilled Water enough to make 1000 p.

Mix the Iron with 200 p. of Distilled Water in a flask, add 34 p. of the Iodine, and prepare a solution of ferrous iodide in the usual manner, aiding the process if necessary, by heating the contents of the flask at first gently, and finally to boiling. Filter the liquid, and wash the filter with about 20 p. of hot distilled Water. To the hot filtrate add the Citrate of Potassium and afterwards the Iodine, and shake until the liquid has assumed a greenish color. Pour this upon the Sugar contained in a tared bottle, and add enough Distilled Water to make 1000 p. The spec. grav. of this syrup, at 77° F. is 1.343.

Each fl.dr. contains about 3.6 gr. of Ferric Iodide.

Note.—This syrup is only of half the strength of the official *Syrupus Ferri Iodidi*. It contains *ferric* iodide, not ferrous. (*N. F. C.*)

342. Syrupus Ferri et Calcii Lactophosphatum.*—*Syrup of Lactophosphate of Iron and Calcium.*

Lactate of Iron, Lactate of Calcium, each 256 gr., Phosphoric Acid (U. S. P.) 6 fl.dr., Hot Water 3 fl.oz., Syrup enough to make 1 pint.

Dissolve the Lactates of Iron and Calcium in the hot Water with the aid of the Phosphoric Acid, and add sufficient Syrup to make *one pint*. (*Pa.*)

343. Syrupus Ferri et Mangani Iodidi.—*Syrup of Iodide of Iron and Manganese.*

Iodine 595 gr., Iron Wire, Sulphate of Manganese, each 192 gr., Iodide of Potassium 230 gr., Water 8 fl.oz., Sugar, white granular 15 av.oz.

Make the Solution of Iodide of Iron in the usual manner by first placing thin Iron wire, cut into small pieces, into a glass flask with 4 oz. of Water and then adding the Iodine. When the reaction has ceased and the solution has acquired a green color, filter it upon the Sugar, contained in a quart bottle. Dissolve the Sulphate of Manganese in 2 oz. of Water and the Iodide of Potassium also in 2 oz. of Water; mix the two solutions, warm gently, and when the Sulphate of Potassium is entirely precipitated, filter the solution into the Sugar; wash the precipitate with half an ounce more of cold Water and filter into the rest. Shake frequently until the Sugar is dissolved and filter the Syrup, if necessary; the whole to measure *one pint*.

Each fl.dr. contains about 6 gr. of Iodide of Iron and 3 gr. of Iodide of Manganese. (*Pa.*)

344. Syrupus Ferri Hypophosphitis.—*Syrup of Hypophosphite of Iron.*

Hypophosphite of Iron (Ferric), Citrate of Potassium, each 128 gr., Orange Flower Water 1 fl.oz., Sugar 13 tr.oz., Distilled Water a sufficient quantity.

Dissolve the Hypophosphite of Iron, with the aid of the Citrate of Potassium, in the Orange Flower Water, and add enough Distilled Water to make 9 fl.oz. In this dissolve the Sugar, and filter. (*Ky.*)

345. Syrupus Ferri Lactophosphatis.*—*Syrup of Lactophosphate of Iron.*

I*. Lactate of Iron 128 gr., Phosphoric Acid, 50%, a suff. quant., Water $\frac{1}{2}$ fl.oz., Syrup enough to make 16 fl.oz.

Dissolve the Lactate of Iron in the Water with the aid of a sufficient quantity (about 2 fl.dr.) of the Phosphoric Acid, and add enough Syrup to make 16 fl.oz.

Each fl.dr. contains 1 gr. of Lactate of Iron as "lactophosphate." (*N. F. C.*)

II. Lactate of Iron 256 gr., Phosphoric Acid, U. S. P., 6 fl.dr., Hot Water 2 fl.oz., Syrup enough to make 1 pint.

Dissolve the Lactate of Iron in the hot Water with the aid of the Phosphoric Acid, and add sufficient Syrup to make the whole measure *one pint*. (*Pa.*)

346. Syrupus Glycyrrhizæ.*—*Syrup of Glycyrrhiza.*

Fluid Extract of Glycyrrhiza 4 fl.oz., Syrup 12 fl.oz.

Mix them. This preparation should be freshly made when wanted for use. If it is to be kept in stock, about one-fourth of the Syrup should be replaced by Glycerin. (*N. F. C.*)

347. Syrupus Hypophosphitum Compositus.*—*Compound Syrup of Hypophosphites.*—Compound Hypophosphites.

I.* Hypophosphite of Calcium 256 gr., Hypophosphite of Potassium, Hypophosphite of Sodium, each 128 gr., Hypophosphite of Manganese 16 gr., Solution of Hypophosphite of Iron 96 min., Hydrochlorate of Quinine 8 gr., Fluid Extract of Nux Vomica $\frac{1}{2}$ fl.dr., Sugar 12 av.oz., Water 7 fl.oz., Hydrochloric Acid a suff. quant., Syrup enough to make 16 fl.oz.

Dissolve the solid Hypophosphites in the Water, add the Sugar, and shake until it is dissolved. Mix the Hydrochlorate of Quinine with about 1 fl.oz. of the Solution, and add enough Hydrochloric Acid (about 3 drops) to dissolve it. Then mix it with the rest of the solution, add the Solution of Hypophosphite of Iron, the Fluid Extract of Nux Vomica, and finally enough Syrup to make 16 fl.oz.

Each fl.dr. contains 2 gr. of Hypophosphite of Calcium; 1 gr. each of Hypophosphite of Potassium and Sodium; $\frac{1}{8}$ gr. each of Hypophosphite of Iron and Manganese, and smaller quantities of bitter alkaloids.

Note.—This Syrup should not be confounded with the *Syrupus Hypophosphitum* (Syrup of the Hypophosphites) of the U. S. Pharm. 1880. (*N. Y. & B.*, revised. *N. F. C.*)

II. Compound Solution of Hypophosphites, Water, each 4 fl.oz., Sugar 14 av.oz.

Mix the Solution with the Water, and add the Sugar, shake frequently until this is dissolved, strain if necessary, and add enough Water to make it measure *one pint*.

Each fl.dr. contains the Hypophosphites of $\frac{3}{4}$ gr. of Calcium, $\frac{1}{2}$ gr. each of Sodium, Potassium and Iron, $\frac{1}{4}$ gr. each of Manganese and Quinine, and $\frac{1}{8}$ gr. of Strychnine. (*Pa.*)

III. Hypophosphite Calcium 360 gr., Hypophos. Sodium, Hypophos. Potassium, each 120 gr., Hypophos. Manganese, Lactate of Iron, Quinine (alkaloid), each 64 gr., Strychnine (alkaloid) 2 gr., Citric Acid 50 gr., Sugar 12 tr.oz., Water 8 fl.oz., Syrup enough to make 1 pint.

Dissolve the Citric Acid in the Water, and in this solution dissolve the alkaloids and then the salts. Then add the Sugar and dissolve it without heat, either by percolation or agitation. If necessary, add enough Syrup to make *one pint*. (*D. C.*)

348. Syrupus Hypophosphitum cum Ferro.—*Syrup of the Hypophosphites with Iron.*

Hypophosphite Calcium 256 gr., Hypophos. Sodium 192 gr., Hypophos. Potassium 128 gr., Hypophos. Iron (Ferric), Citrate of Potassium, each 96 gr., Sugar 13 tr.oz., Orange Flower Water 1 fl.oz., Distilled Water a sufficient quantity.

Dissolve the Calcium, Sodium and Potassium salt in 7 fl.oz. of Water, if necessary by the aid of a gentle heat, and filter. Triturate the magma of the Hypophosphite of Iron (obtained as directed in No 186) with the Citrate of Potassium, add the solution of the other Hypophosphites, and, when complete solution has taken place, the Orange Flower Water and sufficient Distilled Water to make 9 fl.oz. In this dissolve the Sugar, without heat, and filter through paper. (*Ky.*)

349. Syrupus Ipecacuanhæ et Opii.*—Dover's Syrup.—Syrupus Doveri.

I.* Tincture of Ipecac and Opium (U. S. P.) 1 fl.oz., Sugar 11 tr.oz., Cinnamon Water enough to make 12 fl.oz.

Mix the Tincture with 5 fl.oz. of Cinnamon Water, filter, add the Sugar, and then enough Cinnamon Water to make 12 fl.oz. Dissolve by agitation, and strain. Each fl.dr. corresponds to 5 gr. of Dover's Powder. (*N. F. C.*, from *D. C.*)

II. Tincture of Ipecac and Opium, U. S. P., $1\frac{1}{4}$ fl.oz. and 4 min., Syrup enough to make 1 pint.

Mix them. Each fl.dr. represents 5 gr. of *Dover's Powder*. (*Pa.*)

350. Syrupus Mannæ.*—Syrup of Manna.

Manna (Flake) 2 tr.oz., Sugar 12 tr.oz. Water enough to make 16 fl.oz.

Dissolve the Manna in 8 fl.oz. of Water, and filter the solution. To the filtrate add the Sugar, and enough Water to make 16 fl.oz. Dissolve the Sugar with the aid of a gentle heat, and strain. (*N. F. C.*, after *Pharm. Germ.*)

351. Syrupus Papaveris.*—Syrup of Poppy.

Fluid Extract of Poppy 1 fl.oz., Syrup 2 fl.oz.

Mix them.

Note.—This produces a preparation practically identical in strength with that of the *Brit. Pharm.* The corresponding preparation of the *Germ. Pharm.* (Synonym: *Syrupus Diacodii*) requires the following proportions: Fluid Extract of Poppy 1 fl.oz., Syrup enough to make 10 fl.oz. (*N. F. C.*)

352. Syrupus Pectoralis.*—Pectoral Syrup (Jackson).

Hydrochlorate of Morphine 4 gr., Oil of Sassafras 2 min., Syrup of Acacia 16 fl.oz.

Dissolve and mix. This Syrup should be made freshly when wanted for use. (*D. C.*)

353. Syrupus Phosphatum Compositus.*—Compound Syrup of Phosphates.—
"Chemical Food."

I.* Phosphate of Iron (U. S. Ph. 1880) 256 gr., Precipitated Carbonate of Calcium 512 gr., Bicarbonate of Potassium 40 gr., Bicarbonate of Sodium 24 gr., Citric Acid 2 av.oz., Glycerin 2 fl.oz., Phosphoric Acid 4 fl.oz., Orange Flower Water 6 fl.dr., Tincture of Cudbear 2 fl.dr., Water $1\frac{1}{2}$ fl.oz., Syrup enough to make 32 fl.oz.

To the mixture of the Carbonate of Calcium and the two Bicarbonates, contained in a capacious mortar, add the Citric Acid and triturate them with the Glycerin. Then add the Orange Flower Water, about 20 fl.oz. of the Syrup, and gradually the Phosphoric Acid. When effervescence has ceased, add the Phosphate of Iron previously dissolved in the Water, transfer the whole to a graduated vessel, rinse the mortar with a little Syrup, add the Tincture of Cudbear, and lastly, enough Syrup to make 32 fl.oz. Let the Syrup stand during several days, then strain.

Each fl.dr contains about 2 gr. of Phosphate of Calcium, 1 gr. of Phosphate of Iron, and smaller quantities of the Phosphates of Potassium and Sodium. (*N. Y. & B.*, revised. *N. F. C.*)

II. Solution of Phosphate of Iron in scales U. S. P., 50%, $\frac{1}{2}$ fl.oz. and 16 min., Precipitated Carbonate of Calcium 256 gr., Bicarbonate of Potassium, Bicarbonate of Sodium, each 32 gr., Citric Acid 10 dr., Glycerin 1 fl.oz., Phosphoric Acid U. S. P. 2 fl.oz., Hot Water 4 fl.oz., Orange Flower Water 2 fl.oz., Tincture of Cudbear 2 fl.dr., Sugar 14 av.oz.

To the Carbonate of Calcium and Bicarbonates of Potassium and Sodium add the Hot Water and Citric Acid, and triturate in a capacious porcelain mortar until dissolved; then add the Glycerin and Orange Flower Water, and, stirring well, gradually add the Phosphoric Acid, and then the solution of Phosphate of Iron and the Tincture of Cudbear; filter the whole into a quart bottle, and add the Sugar, shaking well until dissolved, to make *one pint*.

Each fl.dr. contains 1 gr. of Phosphate of Iron, 2 gr. of Phosphate of Calcium, and $\frac{1}{4}$ gr. each of Phosphate of Potassium and Sodium. (*Pa.*)

354. **Syrupus Pini Strobi.**—*Syrup of White Pine.*

Note.—The English title has been furnished by *Wis.* Formula wanted.

355. **Syrupus Rhamni Catharticae.***—*Syrup of Buckthorn Berries.*—Syrupus Spinæ Cervinæ.

Fermented Juice of Buckthorn Berries 35 p., Sugar 65 p.

Make a syrup by the aid of heat. (*N. F. C.*, after *Pharm. Germ.*)

356. **Syrupus Rubi Aromaticus.***—*Aromatic Syrup of Blackberry.*

Blackberry Root 2 tr.oz., Cinnamon, Nutmeg, each 120 gr., Cloves, Allspice, each 60 gr., Brandy 8 fl.oz., Sugar 16 tr.oz., Blackberry Juice 16 fl.oz.

Digest the Blackberry Root and spices, all properly comminuted, with the Brandy, then add the Blackberry Juice and strain; finally add the Sugar.

Note.—Compare *Cordiale Rubi* (No. 14).

357. **Syrupus Sanguinariae.***—*Syrup of Sanguinaria.*

Sanguinaria in No. 20 powder 8 tr.oz., Acetic Acid 4 fl.oz., Water 5 pints, Sugar 30 tr.oz.

Mix the Sanguinaria with 2 fl.oz. of Acetic Acid and 1 pint of Water,

and macerate for three days. Transfer the mixture to a glass percolator, and percolate it with a mixture of the remaining Acetic Acid and Water. Evaporate the percolate on a water-bath to 18 fl.oz. In this dissolve the Sugar with the aid of a gentle heat, if necessary, and strain. (*N. F. C.*, from *Ky.*)

358. Syrupus Sennæ Aromaticus.*—*Aromatic Syrup of Senna.*

Senna 4 tr.oz., Jalap $1\frac{1}{2}$ tr.oz., Rhubarb $\frac{1}{2}$ tr.oz., Cinnamon, Cloves, each 60 gr., Nutmeg 30 gr., Oil of Lemon 20 min., Sugar 24 tr.oz., Diluted Alcohol enough to make 32 fl.oz.

Reduce the drugs to a moderately fine powder, and percolate it, in the usual manner, with Diluted Alcohol. Reserve the first 16 fl.oz., and dissolve in this portion the Sugar, if necessary by means of a gentle heat, avoiding loss of alcohol. Allow the solution to cool, then collect a further portion of the percolate and mix it with the solution, until it measures 32 fl.oz. (*N. F. C.*, from *A. P. A. Proceed.*, vol. 22, p. 341.)

359. Syrupus Sennæ Compositus.—*Compound Syrup of Senna.*

Fluid Extract of Senna 2 fl.oz. and 64 min., Fluid Extract of Rhubarb 256 min., Fluid Extract of Frangula 256 min., Oil of Gaultheria $\frac{1}{2}$ dr., Alcohol 1 fl.oz., Syrup enough to make 1 pint.

Dissolve the Oil of Wintergreen in the Alcohol and add to the mixture of the Fluid Extracts; then add the Syrup and shake well. (*Pa.*)

360. Syrupus Sodii Hypophosphitis.*—*Syrup of Hypophosphite of Sodium.*

I.* Hypophosphite of Sodium 256 gr., Citric Acid 10 gr., Sugar 12 av.oz., Water enough to make 16 fl.oz. (*N. F. C.*)

Note.—See remarks to Elixir Ammonii Bromidi.

II. Hypophosphite of Sodium 256 gr., Hypophosphorous Acid, 50%, 1 fl.dr., Hot Water 2 fl.oz., Syrup enough to make 1 pint.

Dissolve the Hypophosphite of Sodium in the hot Water and add the Acid; add enough Syrup to make the whole measure *one pint*. (*Pa.*)

361. Syrupus Stillingiæ Compositus.*—*Compound Syrup of Stillingia.*

Compound Fluid Extract of Stillingia 4 fl.oz., Syrup 12 fl.oz.

Mix them. (*N. F. C.*)

362. Tincturæ.*—*Tinctures.*

General Formula for Unofficial Tinctures—All tinctures for which no working formula is provided in the U. S. Pharmacopœia, the National Formulary, or other standard works of authority, and the strength of which is not otherwise specified by the prescriber, shall be prepared in the following manner:

The Drug, properly comminuted, 2 tr.oz., the Menstruum, enough to make 16 fl.oz.

The choice of the menstruum depends on the nature of the drug. If the useful constituents are soluble in alcohol, and but little, or not at all soluble in water, strong alcohol should be used. Whenever possible, the alcoholic strength should be reduced by choosing a menstruum approaching Diluted Alcohol as nearly as possible, the object being in all cases to exhaust the drug of all useful constituents, but at the same time to retain them in solution.

If the drug is fibrous and can be dried and powdered without injury or loss of useful constituents, percolation is preferable. If the drug is resinous and partly, or almost wholly soluble in the menstruum, or if it be fibrous, and cannot well be powdered without undergoing injury, maceration should be resorted to. In the latter case, the drug, comminuted as much as possible, should be kept in contact with the full quantity of the menstruum for two weeks, or until the soluble matters are extracted, the liquid portion strained off, and the remainder of the tincture contained in the residue on the strainer carefully displaced by washing with a fresh portion of the menstruum until 16 fl.oz. of tincture are obtained for every 2 tr.oz. of drug taken in operation. (*N. F. C.*)

Note.—A list of tinctures in common use might be appended, in which the proportions and the proper menstrua are briefly indicated, for instance :

Tinctura Asari Canadensis 2 tr.oz. in 16 fl.oz. Diluted Alcohol. Tinctura Salinæ 2½ tr.oz. in 16 fl.oz. Diluted Alcohol. (*Brit. Ph.*) Tinctura Santali 4 tr.oz. in 16 fl.oz. Alcohol.

363. Tinctura Aconiti, Fleming.*—*Fleming's Tincture of Aconite.*

Aconite Root in No. 60 powder 16 tr.oz., Alcohol enough to make 24 fl.oz.

Make by percolation. (*N. F. C.*)

Note.—If this Tincture is required for immediate use, it may be made from the Fluid Extract, every fl.oz. of this being diluted with Alcohol to measure 1½ fl.oz.

364. Tinctura Amara.*—*Bitter Tincture.*

Gentian, Centaury (Heib), each 384 gr., Orange Peel 256 gr., Orange Berries, Zedoary, each 128 gr., Diluted Alcohol enough to make 16 fl.oz.

Reduce the substances to a moderately coarse powder and percolate with Diluted Alcohol, until 16 fl.oz. of Tincture are obtained. (*N. F. C.*, after *Ph. Germ.*)

365. Tinctura Antacrida.—*Antacid Tincture (Falk's).*—Fenner's Guaiac Mixture; Dysmenorrhœa Mixture.

Corrosive Chloride of Mercury 20 gr., Resin of Guaiac, Canada Turpentine, each 480 gr., Oil of Sassafras 2 fl.oz., Alcohol 8 fl.oz.

Dissolve the Corrosive Chloride in the Alcohol, add the other ingredients, macerate seven days, and filter. (*D. C.*)

366. Tinctura Antiperiodica, Warburg.*—*Warburg's Tincture*

I.* *Without Alocs.*—Rhubarb, Angelica Seed, each 448 gr., Powdered Opium 16 gr., Elecampane, Saffron, Fennel, each 224 gr., Gentian, Zedoary, Cubebs, Myrrh, White Agaric, Camphor, each 112 gr., Prepared Chalk 224 gr., Sulphate of Quinine 1280 gr., Diluted Alcohol enough to make 8 pints.

Reduce the fibrous vegetable drugs to a moderately coarse powder, mix it with the powdered Opium, and the Myrrh and Camphor, and digest the whole during 12 hours, in a suitable, well-covered vessel, with 7 pints of Diluted Alcohol, on a water bath, avoiding loss of Alcohol by evaporation as much as possible, and strain off the liquid with pressure. Then add the Sulphate of Quinine, heat until it is dissolved, and allow to cool. Finally add the Chalk, mix intimately, and filter. Pass enough Diluted Alcohol through the residue on the filter to make the tincture measure 8 pints.

Each fl.oz. contains 10 gr. of Sulphate of Quinine.

Note.—The loss of alcohol may be prevented by attaching an upright condenser to the vessel or flask in which the digestion is performed.

Note 2.—This preparation is to serve as a *stock* tincture for making the regular "Warburg's Tincture." The latter is sometimes directed to be *without aloes*, and in such cases the above preparation is to be dispensed. When "Warburg's Tincture," without further specification is prescribed, the subjoined formula is to be followed:

II.* *With Aloes.*—Aqueous Extract of Aloes 28 gr., Warburg's Tincture without Aloes 1 pint.

Dissolve the Extract in the Tincture.

Note.—The original directions for administering this remedy in remittent fevers were as follows: One-half ounce is to be given alone without dilution, after the bowels have been evacuated by any convenient purgative, all drink being withheld. After three hours, another half ounce is to be given. (*N. F. C.*)

367. *Tinctura Aromatica.*—*Aromatic Tincture.*

Anise 10 dr., Cinnamon 1 tr.oz., Coriander 5 dr., Caraway 3 dr., Diluted Alcohol enough to make 16 fl.oz.

Reduce the drugs to powder and percolate with Diluted Alcohol until 16 fl.oz. of tincture are obtained. (*Ky.*)

Note.—This is not identical with the *Tinctura Aromatica* of the *Germ. Pharm.*

368. *Tinctura Aurantii Corticis.*—*Tincture of Fresh Orange Peel.*

Sweet Orange Peel, recently separated from the fresh fruit and deprived of the inner, white, spongy layer, 8 av.oz., Alcohol sufficient to make 1 pint.

Crush or grind the Orange Peel to a fine pulp and transfer into a quart bottle, add 14 fl.oz. of Alcohol, and macerate for 5 or 6 days and then express; moisten the residue with 3 fl.oz. of Alcohol and express again; filter the total liquid and add enough Alcohol to make the whole measure *one pint*. (*Pa.*)

Note.—The *Tinctura Aurantii Dulcis* of the U. S. Ph. represents 20% of the fresh outer peel.

369. *Tinctura Benzoini Concentrata.**—*Concentrated Tincture of Benzoin.*

Benzoin 8 tr.oz., Alcohol enough to make 16 fl.oz.

Digest the Benzoin with 4 fl.oz. of Alcohol in a closed vessel, or in a suitable vessel provided with an upright condenser, until it is dissolved. When cold, add enough Alcohol to make the whole measure 16 fl.oz. Strain the solution through muslin, then allow it to settle, and finally pour off the clear solution from any deposited impurities.

Note.—5½ fl.oz. of this preparation mixed with 10½ fl.oz. of Alcohol produces a tincture practically identical with the official *Tinctura Benzoini*. The concentrated tincture is very suitable for making benzoined ointment. (*N. F. C.*)

370. *Tinctura Capsici et Myrrhæ.**—*Tincture of Capsicum and Myrrh.*—Hot Drops; "Number Six" (Thompsonian Name).

Capsicum in No. 20 powder 240 gr., Myrrh in moderately coarse powder 2 tr.oz., Alcohol, Water, each enough to make 16 fl.oz.

Mix the powders intimately with an equal volume of clean sand, and percolate them with a mixture of 9 volumes of Alcohol and 1 volume of Water, until 16 fl.oz. of percolate are obtained. (*N. F. C.*)

371. Tinctura Chloroformi et Morphinæ.*—*Tincture of Chloroform and Morphine.*

Purified Chloroform 1 fl.oz., Stronger Ether 2 fl.dr., Alcohol 1 fl.oz., Hydrochlorate of Morphine 8 gr., Diluted Hydrocyanic Acid $\frac{1}{2}$ fl.oz., Oil of Peppermint, 4 min., Fluid Extract of Liquorice, Molasses, each 1 fl.oz., Syrup a sufficient quantity.

Dissolve the Hydrochlorate of Morphine and the Oil of Peppermint in the Alcohol, and add the Chloroform and Ether. Mix the Fluid Extract of Liquorice and the Molasses with 3 fl.oz. of Syrup, add this to the previously formed solution, mix them thoroughly, add the Hydrocyanic Acid, and enough Syrup to make 8 fl.oz. (*N. F. C.*, from *Brit. Ph.*)

Note.—This preparation is officinal in the new *Brit. Ph.*, and is intended to be used for the same purposes as the nostrum *Chlorodyne*. The *Wis. Comm.* recommends Chandler's or E. Smith's formula for chlorodyne.

372. Tinctura Cinchonæ Detannata.*—*Detannated Tincture of Cinchona.*

I.* Cinchona Bark, Sulphate of Iron in crystals, each 6 av.oz., Glycerin $2\frac{1}{2}$ fl.oz., Sulphuric Acid, Nitric Acid, Solution of Ammonia, Alcohol, Water, each a sufficient quantity.

Convert the Sulphate of Iron into Ferric Hydrate in the usual manner, by means of the Acids and precipitation with Ammonia, wash it, and express it forcibly. Determine the weight of Water contained in this residue by drying a small portion to a constant weight; then mix it with as much Alcohol and Glycerin as will produce the menstruum required by the U. S. Ph. [the proportions by weight being, 10 of Glycerin, 65 of Alcohol, and 25 of Water]. To this mixture of ferric hydrate and menstruum add the powdered bark, mixing the whole intimately, and macerate until a small portion of the liquid, filtered off, ceases to give a bluish-black color with tincture of iron. Then transfer the mixture to a percolator, and percolate, first with the remainder of the Glycerin mixed with its proper proportions of Alcohol and Water, and afterwards with a mixture of 65 parts of Alcohol and 25 parts of Water. Collect the first 30 fl.oz. of percolate and set it aside. Continue the percolation with the last-named menstruum until the bark is exhausted, evaporate the weaker percolate to the consistence of an extract, dissolve this in the reserved portion, and add enough of the last-named menstruum to make 32 fl.oz. of tincture.

Note.—In place of converting 6 av.oz. of crystallized sulphate of iron into tersulphate, 15 av.oz. of the officinal Liq. Ferri Tersulphatis may be employed for the preparation of the ferric hydrate. If the bark is practically exhausted, when the first 30 fl.oz. of percolate have been obtained, the percolation may be stopped when 32 fl.oz., altogether, have been obtained. (*N. F. C.*)

II. Cinchona in very fine powder 8 av.oz., Lime, recently burnt, 2 av.oz., Alcohol, Water, each enough to make 16 fl.oz.

Slake the Lime with 8 fl.oz. of Water into a milk, and with this mix the Cinchona. Dry the mixture *completely*, rub it to a fine powder, and exhaust it with hot Alcohol, using 8 oz. successively, until 16 fl.oz. have been obtained. The liquid may be rendered just perceptibly acid with diluted sulphuric acid, when any lime which may have entered into solution will be precipitated.

Note.—This tincture contains all the alkaloids in solution, crystallizable as well as uncrystallizable, and is $2\frac{1}{2}$ times stronger than the official tincture. It is an adaptation of the U. S. P. process for assaying Cinchona. (III.)

III. Cinchona (Calisaya) 24 tr.oz., Curaçao Orange Peel (in ribbons) 16 tr.oz., Coriander 4 tr.oz., Cardamom $1\frac{1}{2}$ tr.oz., Cinnamon 3 tr.oz., Anise 1 tr.oz., Baker's Cocoa 8 tr.oz., Solution of Tersulphate of Iron, Alcohol, Water, each enough to make 3 gall.

Reduce the drugs to a moderately fine powder, and percolate with a mixture of 1 volume of Alcohol and 3 volumes of Water until 2 gall. of tincture are obtained. Meanwhile, prepare from 6 pints of Solution of Tersulphate of Iron, Hydrated Sesquioxide of Iron by the formula of the Pharmacopœia, measure it, and add to every 4 measures 1 measure of Alcohol; then add of this sufficient to the percolate, obtained as above, to deprive it of its cincho-tannic acid. The absence of the latter is readily ascertained by the addition of a drop of Tincture of Chloride of Iron to a filtered portion of the liquid in operation, which should not be colored by such addition. Should coloration result, the intensity or faintness will serve as a guide to the further quantity of Hydrated Sesquioxide of Iron necessary to completely detannate the preparation. As soon as this result is attained, strain the mixture through a muslin strainer, and, when the liquid ceases to pass, wash the residue upon the strainer with sufficient of a mixture of 1 volume of Alcohol and 3 volumes of Water to make the strained liquor measure 3 gall. (*Ky.*)

Note.—The *Ky.* entitles this “Detannated Calisaya Liquor.”

373. *Tincturæ Aethereæ*.*—*Ethereal Tinctures.*

General Formula.—The Drug 2 tr.oz., Alcohol, Stronger Ether, each enough to make 16 fl.oz.

Percolate the drug in the usual manner, but with proper precaution against loss by evaporation, with a menstruum composed of 1 volume of Stronger Ether and 2 volumes of Alcohol, until 16 fl.oz. of tincture are obtained.

Note.—Ethereal Tinctures of Belladonna, Castor, Digitalis, Lobelia, Valerian, and of other drugs, are to be prepared by the above formula. (*N. F. C.*)

374. *Tinctura Ferri Acetatis*.*—*Tincture of Acetate of Iron (Rademacher.)*

Sulphate of Iron in clear crystals 23 p., Acetate of Lead 24 p., Water 48 p., Diluted Acetic Acid 96 p., Alcohol 80 p.

Dissolve each of the salts separately, in one-half of the Water and Diluted Acetic Acid, mix the solutions in an iron vessel, and heat to boiling. Then allow the mixture to cool, transfer it to a large flask, add

the Alcohol, and set the flask aside loosely stoppered for several months, occasionally agitating, until the liquid contents have acquired a light-red color; then filter. The Tincture contains on an average 1% of metallic Iron. Under normal conditions the specific gravity of the liquid is 0.982, and the total yield of liquid about 230 p.

Note.—The liquid in the flask should present as large a surface as possible to the air, but care must be taken that it shall not lose much by evaporation. Where this preparation is in demand, it is advisable that two flasks be constantly kept on hand, containing the tincture in several stages of progress. (*N. F. C.*)

375. Tinctura Ferri Chloridi Ætherea.*—*Ethereal Tincture of Chloride of Iron.*
Tinctura Ferri Chloridi Ætherea.

Solution of Chloride of Iron, U. S. Ph., 350 min., Stronger Ether 4 fl.oz., Alcohol enough to make 16 fl.oz.

Mix them. Introduce the Tincture into bottles made of white glass, which should not be entirely filled, and having corked them tightly, expose them to the rays of the sun, until the tincture has become entirely decolorized. Then remove the bottles to a shady place, and open them occasionally, until their contents have again assumed a yellow color.

Each fl.dr. contains about $\frac{1}{2}$ gr. of Iron, calculated as metal. (*N. F. C.*, after *Ph. Germ.*)

376. Tinctura Ferri Citro-Chloridi.*—*Tincture of Citro-Chloride of Iron.*—
“Tasteless Tincture of Iron.”

I.* Solution of Chloride of Iron (U. S. Ph.) 4 fl.oz., Citric Acid 2100 gr., Bicarbonate of Sodium 2270 gr., Alcohol 4 fl.oz., Water enough to make 16 fl.oz.

Dissolve the Citric Acid in 4 fl.oz. of Water, heat the solution to the boiling point, and gradually add the Bicarbonate of Sodium. When effervescence has ceased, add the Solution of Chloride of Iron, and cool the mixture. Then add enough Water to make it measure 12 fl.oz., and finally add the Alcohol.

Each fl.dr. contains about $7\frac{1}{2}$ gr. of dry Ferric Chloride.

Note.—This Tincture is about 4 per cent. weaker, in metallic iron, than the official Tinctura Ferri Chloridi. (*N. Y. & B.*, revised. *N. F. C.*)

II. Solution of Chloride of Iron 4 fl.oz., Citric Acid $4\frac{1}{2}$ av.oz. and 2 scr., Bicarbonate of Sodium 4 av.oz. and 6 dr., Alcohol 4 fl.oz., Water enough to make 1 pint.

Rub the Citric Acid to a fine powder, and add to it the Bicarbonate of Sodium; add 4 oz. of Boiling Water; stir until a solution is formed and effervescence has ceased, then add the Solution of Iron, and enough Water to make the whole measure 12 fl.oz., and add the 4 oz. of Alcohol.

This Tincture is about two-thirds the strength of the Tincture of Chloride of Iron, U. S. P. (*Pa.*)

377. Tinctura Ferri Composita.*—*Compound Tincture of Iron.*

Solution of Crude Malate of Iron (No. 230), Vinous Tincture of Rhubarb, each 8 fl.oz., Tincture of Nux Vomica 1 fl.oz.

Mix them. (*N. F. C.*)

378. Tinctura Guaiaci Composita.*—*Tincture of Guaiac (Dewees').*

Resin of Guaiac 4 tr.oz., Carbonate of Potassium $1\frac{1}{2}$ dr., Pimenta in fine powder 1 tr.oz., Diluted Alcohol 2 pints.

Digest for two weeks and filter.

379. Tinctura Iodi, Churchill.*—*Churchill's Tincture of Iodine.*

Iodine 75 gr., Iodide of Potassium 15 gr., Water 2 fl.dr., Alcohol 6 fl.dr.

Dissolve the Iodide of Potassium in the Water; add the Alcohol and the Iodine, and agitate until the latter is dissolved.

Note.—The original formula directed Alcohol of 75%. By mixing official Alcohol and Water in the proportions above given, a 75% Alcohol will be closely approximated. (*N. F. C.*)

380. Tinctura Iodi Decolorata.*—*Decolorized Tincture of Iodine.*

Iodine, Hyposulphite of Sodium, each 230 gr., Water $\frac{1}{2}$ fl.oz., Spirit of Ammonia 1 fl.oz., Alcohol $4\frac{1}{2}$ fl.oz.

Digest the Iodine, Hyposulphite of Sodium and Water at a gentle heat until a perfect solution, of a dark brownish-red color, is produced. Then add the Spirit of Ammonia, shake a few minutes until no more bubbles of gas escape, and the liquid has become colorless. Now add the Alcohol, set the mixture aside for 3 days in a cool place, and then separate the liquid from the crystalline precipitate which has formed. Keep the liquid in glass-stoppered vials. (*N. F. C.*)

381. Tinctura Limonis.—*Tincture of Fresh Lemon Peel.*—*Tinctura Citri Corticis.*

Made from fresh Lemon Peel in the same proportions and manner as the Tincture of fresh Orange Peel (No. 355.) (*Pa.*)

382. Tinctura Pectoralis.*—*Pectoral Tincture.*—*Guttæ Pectorales; Pectoral Drops; Bateman's Pectoral Drops.*

Tincture of Opium 5 fl.dr., Compound Tincture of Catechu 4 fl.dr., Spirit of Camphor 5 fl.dr., Oil of Anise 8 min., Caramel 2 fl.dr., Diluted Alcohol enough to make 16 fl.oz.

Mix and filter, if necessary. (*N. F. C.*)

383. Tinctura Persionis.*—*Tincture of Cudbear.*

I.* Cudbear in fine powder 2 av.oz., Diluted Alcohol enough to make 16 fl.oz.

Pack the Cudbear in a percolator, and pour enough Diluted Alcohol on top, until 16 fl.oz. of Tincture have been obtained. (*N. Y. & B.*, unaltered. *N. F. C.*)

II. *Pa.* uses same proportions, and directs percolation or maceration.

384. Tinctura Phosphori. See *Spiritus Phosphori.***385. Tinctura Phytolacæ Composita.***—*Compound Tincture of Phytolacca.*

Fluid Extract of Phytolacca 3 fl.oz., Fluid Extract of Cardamom 60 min., Diluted Alcohol enough to make 16 fl.oz.

Mix them and filter. (*N. F. C.*, from *A. P. A. Proceed.*, vol. 22. p. 342.)

386. Tinctura Quillaia.*—*Tincture of Quillaia*.—Tincture of Soapbark.

Quillaia in moderately fine powder 4 tr.oz., Alcohol 5 fl.oz., Water 11 fl.oz.

Digest for 3 days, strain and filter.

Note.—This tincture is principally intended for making emulsions. It should not be used for this purpose, however, except by order of or with the knowledge of the prescribing physician. (*N. F. C.*)

387. Tinctura Rhei Aquosa.*—*Aqueous Tincture of Rhubarb*.

Fluid Extract of Rhubarb 750 min., Borate of Sodium 75 gr., Carbonate of Potassium 75 gr., Water 15 fl.oz., Cinnamon Water 2½ fl.oz., Alcohol 2½ fl.oz.

Dissolve the Borate of Sodium and Carbonate of Potassium in the Water, add the Fluid Extract, and then the other ingredients.

Note.—This preparation is liable to spoil if kept too long. Not more than a few weeks' supply should be made at one time. It is of the same strength as the corresponding preparation in the *Germ. Pharm.* (*N. F. C.*)

388. Tinctura Rhei et Gentianæ.*—*Tincture of Rhubarb and Gentian*.

I.* Rhubarb, bruised, 2 tr.oz., Gentian, bruised, ½ tr.oz., Diluted Alcohol 2 pints.

Macerate for 14 days and filter.

II.* Fluid Extract of Rhubarb 2 fl.oz., Fluid Extract of Gentian ½ fl.oz., Diluted Alcohol enough to make 2 pints.

Mix, let stand a day, and filter. (*N. F. C.*, from *U. S. Ph.* 1850.)

389. Tinctura Rhei Vinosa.*—*Vinous Tincture of Rhubarb*.

Fluid Extract of Rhubarb 560 min., Fluid Extract of Orange 142 min., Fluid Extract of Cardamom 70 min., Sugar 2 tr.oz., Sherry Wine enough to make 16 fl.oz.

Mix the Fluid Extracts with 8 fl.oz. of Sherry Wine. In this dissolve the Sugar, then add enough Sherry Wine to make 16 fl.oz.

Note.—This corresponds in strength with the Tinctura Rhei Vinosa of the *Germ. Pharm.* (*N. F. C.*)

390. Tinctura Saponis Viridis Composita.*—*Compound Tincture of Green Soap*.

Green Soap 2 tr.oz., Oil of Cade 2 fl.dr., Alcohol 12 fl.oz.

Dissolve the Green Soap in the Alcohol, add the Oil of Cade, and filter. (*N. F. C.*)

391. Tinctura Theobromatis.—*Tincture of Cacao*.

Freshly Roasted Cacao Beans 16 av.oz., Cinnamon 2 av.oz., Tincture of Vanilla, *U. S. P.*, 2½ fl.oz., Diluted Alcohol enough to make 1 pint.

Reduce the Cacao Beans and the Cinnamon to a moderately fine powder (No. 50) and add 1 pint of Diluted Alcohol, macerate for 4 or 5 days, transfer to a conical glass percolator and percolate, adding sufficient Diluted Alcohol to make the percolate, including the Tincture of Vanilla, measure *one pint*. (*Pa.*)

392. Tinctura Thuja.*—*Tincture of Thuja*.

Fresh Tops of Thuja 2 tr.oz., Alcohol enough to make 10 fl.oz.

Macerate the Thuja for one week with 10 fl.oz of Alcohol, then pour off the liquid and express the remainder. Treat the latter with fresh portions of Alcohol, forcibly expressing each time, and filter the united liquids so that 10 fl.oz. of tincture may be obtained.

393. Tinctura Tolutana Concentrata.*—*Concentrated Tincture of Tolu.*

Balsam of Tolu 8 tr.oz., Alcohol enough to make 16 fl.oz.

Digest the Balsam of Tolu in 4 fl.oz. of Alcohol, in a closed vessel, or in a suitable vessel provided with an upright condenser, until it is dissolved. When cold, add enough Alcohol to make the whole measure 16 fl.oz. Strain the solution through muslin, then allow it to settle, and finally pour off the clear solution from any deposited impurities.

Note.—2 fl.oz. and 208 min. of this preparation, mixed with enough Alcohol to make 16 fl.oz., produce a tincture practically identical with the official *Tinctura Tolutana*. (N. F. C.)

394. Unguentum Acidi Salicylici.*—*Ointment of Salicylic Acid.*

Salicylic Acid 40 gr., Tincture of Benzoin 80 min., Petrolatum 160 gr., Ointment 200 gr.

Dissolve the Salicylic Acid in the Tincture of Benzoin, and, having previously mixed the other ingredients, incorporate the solution with the mixture. (N. F. C.)

395. Unguentum Calaminæ.*—*Calamine Ointment.*—Unguentum Calaminare; Turner's Cerate.

Prepared Calamine 1 p., Ointment 5 p.

Mix them. This Ointment should be freshly prepared when required. (N. F. C.)

396. Unguentum Camphoræ.*—*Camphor Ointment.*—Unguentum Camphoratum.

Camphor 2 p., White Wax 1 p., Lard 6 p.

Melt the Wax and Lard with a gentle heat, then add the Camphor and stir until cold. (N. F. C.)

397. Unguentum Fuscum.*—*Brown Salve.*—Unguentum Matris; Mother's Salve; Onguent de la Mère.

Camphorated Brown Plaster (No. 159) 2 p., Olive Oil, Suet, each 1 p.

Melt them together, and stir until cold. (N. F. C.)

398. Unguentum Picis Compositum.*—*Compound Tar Ointment.*

Oil of Tar 4 p., Spermaceti 6 p., Yellow Wax 22 p., Lard 32 p., Cotton Seed Oil 35 p., Tincture of Benzoin 2 p., Oxide of Zinc 3 p.

Melt the Lard, Wax and Spermaceti with the Cotton Seed Oil at a gentle heat. Then add the Tinct. of Benzoin and continue heating until all the alcohol has escaped. Next add the Oil of Tar, and finally the Oxide of Zinc, incorporating the latter thoroughly, so that on cooling a smooth ointment may result. (N. F. C.)

399. Unguentum Sulphuris Compositum.*—*Compound Sulphur Ointment.*—Hebra's Itch Ointment; Wilkinson's Ointment.

Precipitated Carbonate of Calcium 10 p., Sublimed Sulphur, Oil of Cade, each 15 p., Green Soap, Lard, each 30 p.

Mix the Lard with the Green Soap and the Oil of Cade. Then gradually incorporate the Sulphur and Carbonate of Calcium. (*N. F. C.*)

400. Vinum Angelicæ.—*Angelica Wine.*

A sweet California Wine, known in commerce as *Angelica Wine*, *Sweet Catawba Wine*, or *Sweet California Wine*. It has a pale amber color, a sweet, fruity, agreeable taste and vinous odor, and a specific gravity of about 1.040 at 60° F. (15.55° C.), and contains about 10 to 12 per cent. of Alcohol. (*Pa.*)

401. Vinum Aurantii.*—*Wine of Orange.*

Solution of Oil of Orange 1 fl.dr., Precipitated Phosphate of Calcium 120 gr., Sherry Wine enough to make 16 fl.oz.

Triturate the Solution of Oil of Orange with the Phosphate of Calcium and 12 fl.oz. of the Sherry Wine gradually added. Filter and pass enough Sherry Wine through the filter to make 16 fl.oz. (*N. F. C.*, after *Ky.*)

402. Vinum Carnis.—*Wine of Beef.*

I. Extract of Beef, prepared by Liebig's method, $\frac{1}{2}$ tr.oz., Wine of Orange (No. 401) 1 pint.

Dissolve and filter. (*Ky.*)

II. Extract of Beef (Liebig's) 1 av.oz. and 16 gr., Elixir of Orange 4 fl.oz., Angelica Wine enough to make 1 pint.

Dissolve the Extract of Beef in 8 oz. of Wine, then add the Elixir, and enough Wine to make the whole measure *one pint*. (*Pa.*)

403. Vinum Carnis et Ferri.*—*Wine of Beef and Iron.*—Beef, Iron and Wine.

I.* Extract of Beef 256 gr., Tincture of Citro-Chloride of Iron 256 min., Water, hot, 1 fl.oz., Sherry Wine enough to make 16 fl.oz.

Pour the hot Water upon the Extract of Beef contained in a mortar or other suitable vessel, and triturate until a smooth mixture results. Then gradually add, while stirring about, 12 fl.oz. of Sherry Wine. Next add the Tincture, and finally enough Sherry Wine to make 16 fl.oz. Let stand for a few days, if convenient, and filter. (*N. Y. & B.*, revised. *N. F. C.*)

II. Extract of Beef, prepared by Liebig's method, $\frac{1}{2}$ tr.oz., Wine of Iron (*Ky.*) 1 pint.

Dissolve and filter. (*Ky.*)

III. Extract of Beef (preferably Liebig's) 4 av.oz., Phosphate of Iron (U. S. 1880) 645 gr., Stronger White Wine 52 fl.oz., Syrup 8 fl.oz., Tincture of Fresh Orange Peel 8 fl.oz., Allspice powd. 50 gr., Cloves powd. 15 gr., Water enough to make 5 pints.

Dissolve the Extract of Beef in a part of the Water, and the Phosphate of Iron in the remainder of the Water (using heat, if necessary, and a

small quantity of Citric Acid and Water of Ammonia). Mix the solutions, add the Wine, then the Tincture of Orange Peel and the spices, macerate for four days, and filter. (*D. C.*)

IV. Extract of Beef (Liebig's) 1 av.oz. and 16 gr., Solution of Citrate of Iron and Ammonium, 50%, ½ fl.oz., Elixir of Orange 4 fl.oz., Angelica Wine enough to make 1 pint.

Dissolve the Extract of Beef in 8 oz. Wine, add the Solution of Iron, then the Elixir of Orange, and finally enough Wine to make the whole measure *one pint*. (*Pa.*)

404. Vinum Carnis, Ferri et Cinchonæ.*—*Wine of Beef, Iron and Cinchona.*

I.* Extract of Beef 256 gr., Tincture of Citro-Chloride of Iron 256 min., Sulphate of Quinine 16 gr., Sulphate of Cinchonine 8 gr., Citric Acid 6 gr., Water, boiling, 1 fl.oz., Angelica Wine enough to make 16 fl.oz.

Dissolve the Citric Acid and the Sulphate of Quinine and Cinchonine in the boiling Water, and pour the hot solution upon the Extract of Beef contained in a mortar or other suitable vessel. Triturate the liquid and the Extract until they form a smooth mixture, then gradually add, while stirring, about 12 fl.oz. of Angelica Wine. Next add the Tincture, and finally enough Angelica Wine to make 16 fl.oz. Let it stand a few days, if convenient, and filter. (*N. Y. & B.*, revised. *N. F. C.*)

II. Extract of Beef (Liebig's) 1 av.oz. and 16 gr., Solution of Citrate of Iron and Ammonium, 50%, ½ fl.oz., Sulphate of Quinine 16 gr., Sulphate of Cinchonidine, Citric Acid, each 8 gr., Elixir of Orange 4 fl.oz., Angelica Wine enough to make 1 pint.

Dissolve the Extract of Beef in 4 oz. of Wine, heat the Solution of Citrate of Iron, and dissolve therein first the Citric Acid and then the Sulphates of Quinine and Cinchonidine, and add to the Solution of Extract of Beef; then add the Elixir of Orange, and enough Angelica Wine to make *one pint*. (*Pa.*)

405. Vinum Cinchonæ et Erythroxyli.—*Wine of Cinchona and Coca.*

Fluid Extract of Erythroxyton 1 fl.oz., Wine of Cinchona and Cacao enough to make 1 pint.

Mix and filter if necessary. (*Pa.*)

406. Vinum Cinchonæ et Theobromatis.—*Wine of Cinchona and Cacao.*

Fluid Extract of Yellow Cinchona, Tincture of Cacao, each 1 fl.oz., Syrup 2 fl.oz., Angelica Wine 12 fl.oz.

Mix and filter if necessary. (*Pa.*)

407. Vinum Erythroxyli.*—*Wine of Coca.*

I.* Fluid Extract of Erythroxyton, Alcohol, each 1 fl.oz., Claret Wine 14 fl.oz.

Mix and filter. (*N. F. C.*)

Note.—In place of Claret, any other palatable wine may be used, according to the demand of the prescriber or consumer. (*N. F. C.*)

II. Fluid Extract of Erythroxyton 10 fl.dr., Orange Flower Water 1 fl.oz., Syrup of Orange 2 fl.oz., Port Wine 12 fl.oz.

Mix and filter. (*Ky.*)

408. Vinum Erythroxyli Aromaticum.*—Aromatic Wine of Coca.

Fluid Extract of Erythroxylon 2 fl.oz., Port Wine 5 fl.oz., Compound Elixir of Taraxacum 2 fl.dr., Syrup of Coffee 6 fl.dr., Simple Elixir 9 fl.oz., Sherry Wine enough to make 32 fl.oz.

Mix the first five ingredients with 14 fl.oz. of Sherry Wine. Let the mixture stand three days, then filter it, and pass enough Sherry Wine through the filter to make the product measure 32 fl.oz. (*N. F. C.*)

409. Vinum Ferri.—Wine of Iron.

I. Citrate of Iron and Ammonium 128 gr., Water 2 fl.dr., Wine of Orange 1 pint.

Dissolve the Iron salt in the water, mix with the Wine, and filter. (*Ky.*)

II. Solution of Citrate of Iron and Quinine, 50%, $\frac{1}{2}$ fl.oz. and 16 min., Elixir of Orange 4 fl.oz., Angelica Wine enough to make 1 pint.

If desired, it can be colored red by the addition of one fl.dr. of Tincture of Cudbear. (*Pa.*)

Note.—The *Pa.* entitles this “Vinum Ferri Amatum.” Compare the corresponding preparation of the U. S. Ph.

410. Vinum Fraxini Americanæ.*—Wine of White Ash.

Inner Bark of White Ash in moderately fine powder 8 tr.oz., Stronger White Wine enough to make 16 fl.oz.

Moisten the Bark with 16 fl.oz. of the Wine; macerate it three days in a well-covered vessel, then transfer it to a percolator, and gradually pour on Wine until 16 fl.oz. of percolate have been slowly obtained. Keep the product in well-closed bottles, which should be completely filled and preserved in a cool place. (*N. F. C.*)

411. Vinum Pepsini.*—Wine of Pepsin.

I.* Pepsin, dry and undiluted 128 gr., Glycerin 6 fl.dr., Water 1 fl.dr., Diluted Hydrochloric Acid 75 min., White Wine enough to make 16 fl.oz.

Mix the Water, Glycerin and Diluted Hydrochloric Acid, and agitate the Pepsin with the mixture until it is completely disintegrated and apparently dissolved. Then add enough White Wine to make 16 fl.oz. Allow to stand one week, then filter. (*N. Y. & B.*, revised. *N. F. C.*)

Note.—See remarks to Elixir Pepsini (No. 113).

II. Saccharated Pepsin 256 gr., Stronger White Wine 12 tr.oz., Hydrochloric Acid Lactic Acid, each 1 fl.dr., Glycerin 4 fl.oz.

Mix them, let stand 24 hours, and filter. (*D. C.*)

III. Concentrated Liquid Pepsin, Wine of Orange, each 8 fl.oz.

Mix and filter, if necessary. (*Ky.*)

412. Vinum Picis.*—Wine of Tar.

I.* Tar $1\frac{1}{2}$ tr.oz., Water a sufficient quantity, Sherry Wine enough to make 16 fl.oz.

Upon the Tar contained in a suitable vessel, pour 4 fl.oz. of cold Water and stir the mixture frequently during 24 hours; then pour off the Water and throw it away. Mix the remaining Tar with 2 oz. of pow-

dered pumice-stone and add 16 fl.oz. of Sherry Wine, stir frequently during two hours, then transfer the mixture to a wetted filter and after the liquid has passed, pour on enough Sherry Wine to make the filtrate measure 16 fl.oz.

II. Tar 6 tr.oz., Carbonate of Magnesium 2 tr.oz., Sherry Wine enough to make 4 pints.

Mix the Tar thoroughly with the Carbonate of Magnesium. Add 4 pints of Sherry Wine and digest for an hour. Filter, and add enough Sherry Wine through the filter to make 4 pints. (*D. C.*)

413. Vinum Pruni Virginianæ.*—Wine of Wild Cherry.

I.* Wild Cherry in No. 40 powder 4 tr.oz., Sugar $2\frac{1}{2}$ tr.oz., Angelica Wine 8 fl.oz., Water enough to make 16 fl.oz.

Dissolve the Sugar in 6 fl.oz. of Water; moisten the Wild Cherry with a sufficient quantity of this solution and allow it to macerate for one hour. Then transfer it to a percolator, pour upon it the remainder of the solution, and finally water until 8 fl.oz. of infusion are obtained. With this mix the Wine. (*N. F. C.*)

II. Fluid Ext. of Wild Cherry 1 fl.oz., Syrup of Wild Cherry 2 fl.oz., Solution of Oil of Bitter Almond 10 min., Wine of Orange, 13 fl.oz.

Mix them, allow to stand several days, if convenient, and filter. (*Ky.*)

414. Vinum Pruni Virginianæ Ferratum.*—Ferrated Wine of Wild Cherry.

I.* Tincture of Citro-Chloride of Iron 640 min., Wine of Wild Cherry enough to make 16 fl.oz.

Mix them. (*N. F. C.*)

II. Pyrophosphate of Iron 128 gr., Solution of Citrate of Ammonium $\frac{1}{2}$ fl.oz., Wine of Wild Cherry (*Ky.*) $15\frac{1}{2}$ fl.oz.

Dissolve the Iron salt in the Solution of Citrate of Ammonium with the aid of a gentle heat, and add the Wine. Filter. (*Ky.*)

ERRATA.

Formula

4 read: Water enough to make 9 fl.oz.

55 read: *Note*.—Malate of Iron, in scales, should not be confounded with the Crude Malate of Iron, which is the *Extractum Ferri Pomatum* of the Germ. Pharm. (*N. F. C.*)

60 read: Sulphate of Strychnine $1\frac{1}{4}$ gr. (instead of 1 gr.)

75 insert, after I*, the following :

I, b*. (*Alternate Process*). Phosphate of Iron (U. S. Ph. 1880) 256 gr., Hydrochlorate of Quinine 128 gr., Sulphate of Strychnine $1\frac{1}{4}$ gr., Citrate of Potassium 60 gr., Water $\frac{1}{2}$ fl.oz., Aromatic Elixir, enough to make 16 fl.oz.

Dissolve the Phosphate of Iron and the Citrate of Potassium in the hot Water, and the Sulphate of Strychnine and Hydrochlorate of Quinine in the Aromatic Elixir by heat, and then mix both solutions. (*N. F. C.*)

79 read: Sulphate of Strychnine $1\frac{1}{4}$ gr. (instead of $1\frac{1}{2}$ gr.) At end read: "and $\frac{1}{160}$ gr. of Sulphate of Strychnine."

80 to be cancelled, as it is already printed under No. 75, II.

86 read: Extract of Gentian 70 gr. (instead of Compound Tincture of Gentian 1 fl.oz.), and alter the directions accordingly.

88, I., read: Tincture of Citro-Chloride of Iron 640 min., Compound Tincture of Gentian 480 min., Aromatic Elixir enough to make 16 fl.oz.

113, in directions, read: Hydrochloric Acid (for Lactic Acid).

The formulæ taken from other formularies which had not been examined and discussed by the Committee have been left unaltered, except in a few minor points, which do not affect either the processes or the proportions of the ingredients.

REPORT

ON THE

PROGRESS OF PHARMACY.

FROM JULY 1, 1885, to JUNE 30, 1886.

BY C. LEWIS DIEHL.

The report herewith presented will, it is confidently believed, very thoroughly represent the papers that have been contributed to the pharmaceutical journals both in the United States and abroad since the date of the last report ; more thoroughly in fact than has hitherto been the case. Through the kind attention of the Permanent Secretary of the Association, who had issued a circular letter to the Secretaries of the different State Associations requesting information on certain points to be embodied in the report, the reporter has been the recipient of quite a number of the reports of the proceedings of different State Associations, and these have supplied no small proportion of the contribution to pharmaceutical literature.

Not having been favored with these "Proceedings" for previous reports, it was possible heretofore only to give fragmentary information respecting the work accomplished, and much that was valuable and interesting had thus escaped notice.

For the present report, it is true, the "Proceedings" of a limited number only of the State Associations have become available, though it is confidently expected that before the "Proceedings" of this Association go into print, a majority of them will have come to hand, and, if so, will be abstracted.

Whilst in the majority of instances the "Proceedings" of the State Associations are moderate-sized pamphlets, in others the volume approximates, not alone in size, but also in the amount of work accomplished, and in the number and quality of the papers read, to what is accomplished by this, the parent Association. In point of fact the State Associations are young giants, some of which are not far behind the National Association in the number of their membership, and, it is pleasant to note, in the honest as well as successful endeavor to elevate the standard of our

profession in their respective territories. The labor of these State Associations, however, having to a greater or less degree for its object the protection and furtherance of local interests, differs to some extent from that of the National Association. Thus trade interests, which are carefully excluded from the business of our Association—and should be rigidly so—constitute an important part of the transactions of most of the State Associations.

It is true that an ideal Pharmaceutical Association should, like the National Association, confine its efforts towards the advancement of pharmacy from the professional and scientific standpoint, and relegate all subjects pertaining to the conduct of business to local trade associations, which might be organized for that purpose. But it has been the experience that local associations organized for the sole purpose of protecting and regulating trade interests are short of life, and that it takes some interest beyond that of dollars and cents to insure permanent and harmonious union.

This interest is found in the interchange of thought on topics of a purely professional and scientific character, and it is this that must predominate more and more as the State Associations grow older, whilst trade interests must dwindle to insignificant proportions, and finally cease to form any part of their deliberations.

The question then arises, how can we best secure this desirable change for the better? In the larger associations this problem will doubtless be worked out in a relatively short time. Here we find a sufficient number of members who have not alone the ability, but also the will to communicate the subjects of their experiments, experience or thought to the Associations to which they are affiliated, and thus assure the contribution of a number of papers sufficient to give the annual meeting a professional and scientific complexion that may confidently be expected to grow from year to year.

In the smaller associations, while there is apparently no lack of good will, the number of members able or willing to contribute papers is necessarily small, the organization possibly less complete, and as a result trade interests are given more prominence in the deliberations than those interests for which the association has been primarily organized. It is difficult even in the larger associations to find acceptors for the scientific and professional queries that are annually propounded, and therefore next to impossible to find acceptors among the limited number of members in attendance at the meetings of some of the smaller associations.

Moreover, in some of the States pharmacists have as a class had very little opportunity to acquire the theoretical knowledge so necessary to their calling, whereas in others the educational facilities have been ample, and have been profitably used. It seems, therefore, desirable that some general plan be adopted whereby discussion on professional and scientific subjects

may be ensured, even in the absence of papers or communications of such character.

The keynote to this is given by the Massachusetts State Pharmaceutical Association. At the last annual meeting of that Association, twelve topics, bearing, it is true, in part upon simple trade interests, were brought forward and discussed. It seems to your reporter that if a certain number of topics upon subjects having a bearing on the profession and science of pharmacy were selected annually, for discussion at the next annual meeting, the true interests of each State Association would be very materially enhanced, whilst at the same time the lack of scientific papers would be in a great degree neutralized. These discussions would be educational in their tendency, would point out the objects worthy of research, and in every way pave the way to more profitable meetings in the future.

A subject that has engaged the attention of nearly every State Association during the past year is that of Unofficial Formulas. In nearly every instance the associations guarantee their support to such formulas as may be adopted by the National Association, while many have in addition appointed committees to act in concert with, or to report to the Committee of this Association.

The subject of adulteration has elicited several interesting reports, a subject which should, indeed, receive more general attention of the State Associations. It is of the utmost importance that pharmacists in different localities should have reliable information as to the condition of their own particular market, or of the market from which they are supplied; for there is no doubt that adulterated, sophisticated, or otherwise inferior drugs still find ready sale in many localities.

Reports on the Progress of Pharmacy have been made to several associations. These of necessity are limited in their scope, and are most useful when pharmaceutical progress is discussed from a broad and comprehensive point of view. Attention might be briefly drawn in such reports to new medicaments and appliances introduced during the year, but any attempt to go beyond this limit, unless it should be contemplated to cover the entire field of pharmaceutical literature, must necessarily add to the incompleteness of such a report.

Discussions of the present relations of pharmacy to kindred professions, of the directions in which advance has been made and the directions in which it has retrograded, coming from different localities and different writers, would, in the opinion of your reporter, be both desirable and profitable contributions to our literature.

Of other subjects discussed and acted upon by the different State Associations, the furtherance of legislative enactments calculated to regulate the practice of pharmacy and the sale of poisons, are interesting themes which have in some cases been fruitful of results; though it is questionable whether the action in the latter cases has been always judicious.

In the following is given in brief a review of the most interesting points collected from the "Proceedings" of the different State Pharmaceutical Associations, the subjects aimed at being:

1. The number of members present at the meetings.
2. The number of members elected at each meeting.
3. The total membership.
4. The titles of papers read.
5. The measures adopted for promoting the progress of pharmacy.
6. The place and time for the next meeting. The arrangement is in chronological order of the meetings held.

Illinois Pharmaceutical Association.—The sixth annual meeting was held in Chicago, September 22 to 24, 1885. Members in attendance, 176. New members elected 43. Present membership, 800.

Important Reports: (1) Committee on Trade Interests. (2) Committee on Adulterations.

Papers: A. E. Ebert: What Drugs and Preparations are prescribed by physicians in Illinois.

H. V. Garrison: "Outline of a course in Chemistry."

E. S. Bastin: "Outline of a course in Botany and Materia Medica."

Oscar Oldberg: "Outline of a course in Pharmacy."

C. H. Grube: "Officinal Flora of Robinson township (Crawford Co. Ills)."

Michigan State Pharmaceutical Association.—Third Annual Meeting was held in Detroit, October 13 to 15, 1885. Members in attendance, 230. New members elected, 248. Present membership, 694.

Important Reports.—Committee to promote the passage of a Pharmacy Bill. Committee on Trade Interests.

Important Resolutions.—Appointing Committee to act in conjunction with the Committee of the American Pharmaceutical Association on Un-official Formulas.

Papers.—John S. Dunn: "Antidotes to be directed on Poison Labels."

George Gundrum: "Strength of Aqua Ammoniae and of the Mineral Acids of Commerce."

W. F. Ranke: "The Pepsins of Trade."

Jacob Jesson: "Galenical Preparations conveniently and advantageously made by the Dispensing Pharmacist."

T. J. Wrampelmeier: "(1) Oleate of Zinc. (2) Oleate of Arsenic."

S. S. Garrigues: "Bromine and the Saline Wastes of the Saginaw Valley."

A. B. Stevens: "On the Quality of Solution of Citrate of Magnesium furnished by manufacturers."

C. S. Burroughs: "How to avoid the demand for the various brands of Fluid Extracts."

Otis C. Johnson : "Useful Analytical Tests easily made by Dispensing Pharmacists."

William A. Hall : "Proportion of Calcium Sulphate contained in Commercial Precipitate Sulphur."

Albert B. Prescott : "How does the Tincture of Iodine in use conform to the Pharmacopœial standard of strength?"

Frank M. Clark : "Analysis of certain Cosmetics."

Henry Palmer : "Proximate Analysis of Viburnum Lentago (seu V. Prunifolium)."

Adolph E. Melcher : "Examination of Volatile Oils."

A. Gertrude Flanders : "Aromatic Spirit of Ammonia."

A. B. Lyons : "(1) Criticism of the requirements of the German Pharm. for 'Podophyllum.' (2) To what extent does the requirement of the U. S. Pharm. to fix the strength by the amount of extract secure uniformity in the product? (3) Simple method of assay in Crude Ipecac. (4) The Specific Gravity table of the U. S. Pharm. (Supplemental report). (5). Experimental determinations of the coefficients of expansion by heat of official liquids, particularly of solutions, dilute acids, etc."

The next meeting will be held in Grand Rapids, on the second Tuesday of October, 1886.

New Hampshire Pharmaceutical Association.—The Twelfth Annual Meeting was held at Concord, November 3, 1885.

Members in attendance, 25. New members elected, 6. Present membership, 80. The next meeting will be held in Manchester, September 14, 1886.

Connecticut Pharmaceutical Association.—The tenth annual meeting was held in New Haven, February 2d and 3d, 1886. Several papers were read, but their titles have not been ascertained by the reporter. The next meeting will be held at Meriden.

Iowa State Pharmaceutical Association.—The seventh annual meeting was held in Des Moines, February 10th and 11th, 1886.

Important Discussions : (1) Draft of a bill amending the pharmacy act. (2) Request that the General Assembly appropriate \$3,000 for the equipment of the laboratory of its Department of Pharmacy.

Papers : These seem to relate exclusively to trade interests. Titles not ascertained.

The next meeting will be held at Waterloo, May 11, 1887.

California Pharmaceutical Association.—A meeting was held February 11, 1886.

Papers : Prof. Behr: Observations on Insectivorous Plants.

Mr. Sommer : "Process for making Mercurial Ointment."

Val. Schmidt: "(1) Ginger Ale Syrup. (2) Syrup of Ferrous Iodide."

S. A. McDonnell: "Analysis of an Anti-ferment."

F. C. Keil: "On California Licorice Root."

F. A. Grazer: "On Cantharidal Collodion."

C. Troppmann: "On Pharmacy Laws."

Georgia Pharmaceutical Association.—The eleventh annual meeting was held in Savannah, April 13th and 14th, 1886.

Important Discussions: Legislation requiring scarlet labels for morphine.

Papers: Several were read, but their titles not ascertained.

The next meeting will be held on Cumberland Island on the 12th of April, 1887.

Louisiana State Pharmaceutical Association.—The fourth annual meeting was held in New Orleans, April 21st and 22d, 1886. Member in attendance, 22. New members elected, 3. Present membership, 139.

Important Reports: (1) Committee on Trade Interests. (2) Committee on Adulterations and Deterioration of Drugs.

Papers: Hiland Flowers: On Physicians prescribing Proprietary Medicines.

R. A. Girling: On the same subject.

Ferd. Lascar: (1) On the same subject. (2) On disguising the taste of Quinine. (3) On Papayotine.

The next meeting will be held in New Orleans on the second Wednesday in April, 1887.

Texas Pharmaceutical Association.—The seventh annual meeting was held in Dallas on the 27th of April, 1886. No particulars have been available to the reporter. The next meeting will be held at Fort Worth on the second Tuesday of May, 1887.

Arkansas Pharmaceutical Association.—The third annual meeting was held at Little Rock on April 29th, 1886.

Important Resolutions: (1) Adoption of the New York and Brooklyn Formulary. (2) Draft of a Pharmacy Law.

Papers: Two papers were read, but the titles have not been ascertained.

The next meeting will be held simultaneous with the meeting of the State Medical Society.

Kentucky Pharmaceutical Association.—The ninth annual meeting was held in Bowling Green May 5th and 6th, 1886. Members in attendance, 33; new members elected, 17; present membership, 183.

Papers: J. W. Fowler: "On Tablet Triturates and Soluble Triturates for Hypodermic Use."

The next meeting will be held in Louisville on the third Wednesday in May, 1887.

Virginia State Pharmaceutical Association.—The fifth annual meeting was held in Alexandria, May 11th, 1886. Members in attendance, 43; new members elected, 26; present membership, 270.

Papers: T. Roberts Baker: "On Syrup of Wild Cherry Bark."

J. V. Ramos: "Has the Metric System any advantage as compared with our present system in the preparation of prescriptions or the practice of pharmacy?"

J. L. Keller: "There is a relation between the specific gravity, the specific heat, and the combining number of the chemical elements."

J. W. Thomas: "On Areca Nut."

C. B. Fleet: "On training young men for the drug business."

The next meeting will be held in Richmond on May 10, 1887.

Alabama Pharmaceutical Association.—The fifth annual meeting was held in Birmingham on May 11, 1886. No particulars have become available to the reporter. The next meeting will be held in Mobile on the second Wednesday of May, 1887.

East Tennessee Pharmaceutical Association.—The first annual meeting was held in Knoxville, May 11th, 1886. No particulars have become available to the reporter. The next meeting will be held at Cleveland on the second Tuesday of October, 1887.

Maryland Pharmaceutical Association.—The fourth annual meeting was held in Annapolis, June 1, 1886.

Important Resolutions: (1) Draft of Pharmacy Law to be presented to all the pharmacists of the State with a view to further discussion. (2) Approval of Memorial to Congress to abolish tax on alcohol when used for manufacturing purposes.

Papers: A number were read, but their titles have not been ascertained.

The next meeting will be held at Ocean City on the 19th of July, 1887.

Massachusetts State Pharmaceutical Association.—The fifth annual meeting was held in Boston June 1, 2 and 3, 1886. Members in attendance, 100; new members elected, 94; present membership, 545.

Important Reports: (1) Committee on Trade Interests. (2) Committee on Formulary.

Important Discussions: A series of twelve topics, propounded by a committee, was discussed during the different sessions of the meeting. These related to legislation, mutual fire and life insurance, sale of opium, the practice of pharmacy, the relation of pharmacy to medicine, the responsibility of pharmacists for the quality of drugs purchased from

wholesale dealers, prizes for papers, and the advisability to reimpose a special tax on proprietary articles, and to abolish the same on liquors.

Papers: Wm. W. Bartlet: "Milk Analysis."

C. P. Pengra: "The advance of Pharmacy during the past year."

S. A. D. Sheppard: "Methods to secure accuracy and dispatch in dispensing medicines."

Henry Canning: "How to regain our lost trade in Toilet Articles."

Wm. C. Durkee: "Quality of the precipitated Carbonate of Calcium of Commerce."

J. W. Colcord: (1) "Criterion of the pharmacopœial methods of Percolation." (2) "Education of Clerks unable to attend a College of Pharmacy,"

G. F. H. Markoe: "Incompatibility of Chloral Hydrate in the presence of Bromide of Potassium and Alcohol."

Frank A. Davidson: "Pure Wool Fat."

The next meeting will be held at Holyoke, June 6, 1887.

Ohio State Pharmaceutical Association.—The eighth annual meeting was held in Springfield, June 2 to 4, 1886. Members in attendance (not ascertained). New members elected, 81. Present membership, 892.

Papers: F. A. Bauer: "Cause of effervescence of a mixture of Borax, Bicarbonate of Sodium, Glycerin and Water."

J. C. Bolger: "Saccharated Pepsins of the market."

C. M. Miller: "(1) Formula for Beef, Wine and Iron. (2) To what extent should the Pharmacist be his own manufacturer? (3) To what extent does the Compound Spirit of Juniper of the Pharm. 1880, replace gin? (4) Question to test the qualification of Apprentices."

J. J. Beck: "Purity of Commercial Santonin."

E. Goodman: "(1) What is the proper color of Mercurous Iodide? (2) Questions to test the qualification of Apprentices."

A. Thruston: "Analysis of, and antidotes for 'Rough on Rats.'"

C. F. Hall: "(1) Does the 'Rock Candy Syrup' of the market contain Glucose? (2) Examination of the Calomel of the market."

W. Simmons: "(1) Is it advisable to make Spiritus Ætheris Nitrosi from the concentrated nitrous ether of the market? (2) Percentage of NH_3 in the commercial grades of Ammonia-water."

H. C. Cook: "Strength of the various brands of Chloride of Lime."

The next meeting will be held in Akron, on the second Wednesday of June, 1887.

Illinois Pharmaceutical Association.—The seventh annual meeting was held in Rockford, June 8 to 10, 1886. Members in attendance, 200. New members elected, 101. Present membership, 900.

Papers: "What drugs and preparations are prescribed by physicians in Illinois."

“List of full and of abbreviated names to serve as a guide for shop labels.”

“Qualification of apprentices, with particular reference to the eventual examination before the State Board of Pharmacy.”

“Medicated waters of the Pharmacopœia.”

“Comminution of drugs for percolation by the use of hand mills and mortar and pestle.”

“Syrups of Pharmacopœia: Improved processes, particularly of the syrups of orange peel, tolu, ginger, rhubarb, aromatic rhubarb, and compound sarsaparilla.”

“To what extent are the large orange industries of Florida and the Pacific coast utilized for the benefit of pharmacy, particularly as regards the oil and peel?”

“The value of holding a membership in the Illinois Pharmaceutical Association.”

“The feasibility or desirability of a Mutual Fire Association in connection with the Illinois Pharmaceutical Association.”

“What will best mask the Odor of Iodoform, without in any way impairing its virtue?”

“What is the nature of the so-called Distilled Extract of Witch Hazel; how is it prepared, etc.?”

“Prevention of Fungi in solutions of alkaloids.”

“To what extent do Abstracts replace the powdered extracts of the market.”

“Is a knowledge of Botany of practical value to pharmacists?”

“Are the Pressed Herbs of the market true to name? Is it desirable to have the date of their packing affixed on the label?”

“Defects in the present State Pharmacy Law.”

“Hydrochlorate of Quinine.”

“The Flora of Assumption and Cherry townships, McLean Co., Ills.”

“The next meeting will be held at Decatur, the date to be announced by the Executive Committee.”

Indiana Pharmaceutical Association.—The fifth annual meeting was held in Lafayette, June 8th and 9th, 1886. A number of papers were read, but their titles were not ascertained. The next meeting will be held in Richmond.

New York State Pharmaceutical Association.—The Eighth Annual meeting was held in Rochester, June 8 to 10, 1886. Members in attendance, 128; New members elected, 55. Present membership, 739.

Important Reports: (1) Committee on Trade Interests. (2) Committee on Adulteration. (3) Committee on Legislation.

Papers: E. A. Sayre: “Recognition of Pharmacists.”

R. G. Eccles: “(1) Salicylic acid as a preservative. (2) Paraldehyde. (3) Analysis of Prescriptions.”

C. N. Lake: "Double Salts of Iron."

Charles Khuen: "(1) Tincture of Opium. (2) Elixir of Pepsin, Bismuth and Strychnine. (3) Benzoated Lard."

Clay W. Holmes: "(1) Quinine Pills. (2) Glucose Syrup."

J. Hungerford Smith: "(1) Calomel. (2) Analysis of Prescriptions."

Charles Rice: "Commercial Chrysarobin."

A. Sagar: "(1) 'Establishment of a Druggists' Exchange Bureau. (2) Analysis of Prescriptions.'

S. J. Bendiner: "Hints for Prescriber and Dispenser."

A. B. Husted: "Analysis of Prescriptions."

W. P. De Forrest: "Analysis of Prescriptions."

P. W. Bedford: "(1) Precipitated Chalk. (2) Cream of Tartar."

D. L. Haigh: "Bismuth Salts."

The next meeting will be held at Thousand Island Park, June 14, 1887.

Pennsylvania Pharmaceutical Association.—The ninth annual meeting was held in Lebanon, June 8 to 10, 1886. Members in attendance, 93. New members elected, 29. Present membership, 518.

Important Reports: (1) Report of the Committee on Unofficial Formulæ, to be presented to the Committee on Unofficial Formulæ of the American Pharmaceutical Association. (2) Report of the Committee on Legislation, proposing an amendment to the present draft of a pharmacy law of Pennsylvania, with a view to removing certain objections, etc.

Papers: John M. Maisch: "Yield of Extract of Nux Vomica."

G. W. Stoeckel: "Indigenous Materia Medica Drugs collected in Pennsylvania."

Stephen Cisin: "The practical value of a knowledge of Botany to the Pharmacist."

William L. Turner: "Why not have a single *American Standard* of weights and measures for *American Pharmacy*?"

John W. Miller: "(1) Goods on Commission. (2) Efforts to elevate their profession by pharmacists."

Louis Emanuel: "How can membership in the State Pharmaceutical Association be made a desirable necessity for every Pharmacist?"

John W. Ridpath: "(1) How can Country Pharmacists induce Physicians to prescribe instead of compounding? (2) Prevention of Crystallization of Pure Honey."

M. N. Kline: "Does it pay to become a member of the Pennsylvania Pharmaceutical Association?"

L. E. Sayre: "Concentrated Nitrous Ether of Commerce."

C. A. Heinitsh: "(1) Camphor Cerate. (2) Oil of Camphor. What are its legitimate and other uses?" etc.

G. W. Kennedy: "To what extent is Annatto adulterated?"

J. B. Duble: "Petroleum Ointments of the market."

S. Henry Stevens: "Officinal Drugs and Preparations for which there is little demand."

Henry Trimble: "Quality of Citric and Tartaric Acids of commerce."

D. Phreaner: "Inducements for young men to enter the drug business."

C. L. Lochman: "On determining the purity of Bees-wax."

Charles D. Lippincott: "Tabulated List of Explosive Substances."

Charles T. George: "Formation of Oleates in officinal Ointments."

John F. Patton: "Desirability that Pharmacists should organize a mutual fire and life insurance company."

The next meeting will be held in Philadelphia June 14, 1887.

Kansas Pharmaceutical Association.—The seventh annual meeting was held in Emporia, June 9 and 10, 1886. Members in attendance, 90; new members elected, 30; present membership, 283.

Important Resolutions: (1) Recognition and adoption of the New York and Brooklyn Formulary as a basis for a National Formulary. (2) Request that the Kansas Board of Pharmacy make its examination of candidates more stringent.

Papers: L. E. Sayre: "On Scale Pepsins."

Charles Laurence: "Druggists as Saloon Keepers."

Albert Totter: "Features of Prohibitory Law."

O. A. Wall: "Requisites for Apprenticeship to the Business of Pharmacy."

R. J. Brown: "Kansas Plants."

The next meeting will be held in Wichita, June 8, 1887.

Missouri Pharmaceutical Association.—The eighth annual meeting was held at Sweet Springs, June 15 and 16, 1886. Members in attendance, 79; new members elected, 138.

Important Reports: (1) Committee on Trade Interests. (2) Committee on Legislation.

Important Resolutions: (1) Favoring local (county) associations. (2) Appointing a Committee to act with the Committee on Unofficial Formulas of the American Pharmaceutical Association.

Papers: O. A. Wall: "On the advisability of making a class of preparations having equal doses of drugs of different strengths."

Charles O. Curtman: (1) "Oil of Indian corn. (2) Detection of small amounts of Salicylic Acid."

J. H. Morrison: "Practical plan for the case of Poisons."

G. H. Chas. Klie: "Quality of the Opium of commerce."

The next meeting will be held at Sweet Springs, on the third Tuesday of June, 1887.

Minnesota Pharmaceutical Association.—The second annual meeting was held in Minneapolis June 15 and 16, 1886. Members in attend

ance, nearly 200. New members elected, 53. Present membership, 205.

Papers: E. Weschke. "Poppy Culture and Opium Production in the U. S."

D. A. Petre: "The indiscriminate sale of Poisons."

C. L. Mitchell: "The relation of Druggist and Pharmacist."

The next meeting will be held at New Ulm, June 9 and 10, 1887.

PHARMACY.

A. APPARATUS AND MANIPULATIONS.

WEIGHTS AND MEASURES.

Weights and Measures—Single Standard.—Mr. Wm. L. Turner, in reply to a query, advocates the adoption of a single standard of weights and measures for American Pharmacy, which he proposes to be as follows:

Proposed Change Compared to Standards in Use.—15 grains one weight or metric gram, 500 grains one ounce, 14 ounces one pound.

	Weights or Grams.	Old Grains.	New Grains.
Avoirdupois Pound	Approximately 453 $\frac{1}{2}$	Accurately 7.000	Approximately 6.804
New Pound.	Accurately 466 $\frac{2}{3}$	Approximately 7.201 $\frac{1}{2}$	Accurately 7.000
Troy Ounce.	Approximately 31 $\frac{1}{10}$	Accurately 480	Approximately 466 $\frac{1}{2}$
New Ounce	Accurately 33 $\frac{1}{3}$	Approximately 514	Accurately 500
One Weight or Gram.	One Dec. Wt.	One Centi. Wt.	One Milli. Wt.
= 15 Grains	Accurately 1 $\frac{1}{2}$ grains	Accurately $\frac{3}{20}$ grains.	Accurately $\frac{8}{200}$ grains

The author's discussions on the subject will be read with interest in Proc. Penna. Pharm. Assoc., 1886, 152-157.

PERCOLATION AND EXTRACTION.

Percolators—Sprinkler Tops or Stop-Cocks.—Mr. E. V. Zoeller has employed the metal "sprinkler" top, commonly used on perfume vials, etc., to control the flow of liquids from percolators. There are numer-

ous styles of these "sprinklers," and it is perhaps immaterial which kind is used. Only, they should have a stem of proper diameter, adjusted to the size of the percolator, and should permit the liquid to pass at any rate of flow that may be desired, either in drops or in a stream.—*Amer. Drugg.*, June 1886, 103.

Percolation—Review.—Prof. P. W. Bedford contributes a paper on percolation intended particularly for young students, which will be very usefully consulted by old students in *Pharm. Rec.*, January 15, 1886, 19-20.

Percolation—Modification of the Official Directions.—Mr. J. W. Colcord finds the preliminary maceration directed in the *Pharmacopœia* to be objectionable, his experience showing that better results are obtained if about one-eighth or one-fourth of the desired amount of percolate is collected, and then maceration and percolation alternately proceeded with. The details of the author's views will be found in *Proc. Mass. Pharm. Assoc.*, 1886, 170-175.

Extraction Apparatus—Modified Construction.—Mr. Walter H. Ince describes an extraction apparatus of simple construction, by means of which the vapor is conveyed through the centre of the substance to be exhausted, and the employment of much heat is avoided. The outer vessel consists of a wide tube drawn out at one end; the inner one is an ordinary piece of narrow glass tubing, having two flanges made by slightly pressing the tube when heated by a pair of crucible tongs. On these flanges the tube rests. The condensing tube, surmounting the apparatus, has a small blown glass funnel, fused or otherwise attached. To charge the apparatus, the inner tube being placed perfectly upright and resting on the narrow portion in the outer, a plug of cotton is placed all around it, and the powdered drug poured on the cotton plug. The vapor rises through the inner tube, the surrounding drug acting as a steam jacket is condensed in the surrounding condensing tube and flows back upon the drug, through which it percolates to be again converted into vapor in the receiving vessel.—*Phar. Jour. and Trans.*, Febr. 13, 1886, 683.

Condenser for Extraction Apparatus.—Mr. F. Allihn describes an improved form of upright condenser, which may be used with highly volatile substances, such as ether, without having to fear any loss of liquid. The condensing tube consists of a narrow glass tube into which a series of four or more bulbs are blown. It has been ascertained by the author that this form of condenser is the most effective. When the ether boils briskly (at a temperature of the water-bath of 60-70° C.), and a moderate current of water passes through the condenser, the ether vapor is almost completely condensed in the two lower bulbs. Only when a large volume of vapor is suddenly given off, does any of it ascend as high as the fourth bulb.—*Zeitsch. f. Anal. Chem.*, 1886, 36.

PRECIPITATION, FILTRATION, ETC.

Precipitation—Rapid Separation when Slimy.—Mr. Zulkowsky states that the rapid separation of slimy precipitates may often be effected by shaking the liquid containing the precipitate with one-third its volume of ether. The ether appears to surround the precipitated matter and to carry it to the surface, so that it can easily be decanted from the clear liquid beneath. The plan has been successfully applied both in the separation of organic and inorganic compounds.—*Zeitschr. f. Anal. Chem.*, xxv, 211.

Toughened Glass Beakers.—Mr. R. J. Friswell gives some details of his experience with toughened glass beakers: Of 24 purchased in 1884, 2 burst spontaneously, one on hot water being poured in, 6 became useless by fissures and exfoliation, and 3 were broken by unknown means. The author concludes that, taking into consideration the loss of confidence caused by the high percentage of spontaneous bursting, it may be said that toughened glass is a complete failure in the laboratory.—*Amer. Drugg.*, Sept. 1885, 176.

Dialysis—Relative Permeability of Various Diaphragms.—From the quantitative results attained on the dialysis of different crystalline and colloid substances, Mr. A. Zott arrived at the following conclusions: (1) The most useful, homogeneous and water-tight material as a dialysis, is goldbeater's skin, which is twice as effectual under the same conditions as parchment paper. But in the case of solutions which attack organic membranes, ordinary clay cells are most useful, although their permeability is sixty to seventy-five times less than that of goldbeater's skin. (2) The rapidity of the diffusion is increased by the complete exhaustion of the air collected within the pores of the dialysis; the rapidity is also dependent rather on increase of volume of the solution than on increase of mass dissolved. After a preliminary exhaustion, endosmose takes place even in cases of slowly diffusible substances, such as the so-called colloids. (3) Two or more substances present in a solution are more rapidly and completely separated the greater the difference of their diffusion velocity; the terms colloid and crystalloid are purely relative. (4) Separation by dialysis is more rapid the more often the liquid in the outer vessel is renewed. (5) With decrease of concentration, the diffusion velocity of salts, whether dissolved separately or admixed, decreases up to a certain point, from which it again increases slowly.—*Jour. Chem. Soc.*; *Ann. Phys. Chem.* (2) xxvii. 229–289.

Drop Funnels—Construction.—It is often necessary to arrange funnels in such a manner that their elongated neck dips into a liquid. At the same time it may be desirable to admit fresh liquid only in drops, but the rate of flow cannot well be either seen or controlled in the common long-necked funnels, since their bore does not permit drops to separate. This drawback is removed by employing a funnel designed by Dr. J. Walter.

The neck of this funnel, being provided with a stop-cock, is connected with a second neck, which, at the point of connection, is blown out into a bulb. This permits the dropping of the fluid at any desired rate, the same being controlled by the stop-cock. The apparatus is shown in a cut in *Amer. Drugg.*, Mar. 1886, 46, together with a similar arrangement somewhat more complicated.—*Zeitsch. f. Anal. Chem.*, 1885, 428.

A Novel Filter.—In order to meet the difficulty which occurs in redissolving a precipitate from a filter after washing, Mr. Gooch has conceived the idea of using a filter made of a material that is easily soluble in solvents that do not affect the precipitate under treatment. Such a material is anthracene, which is easily soluble in naphtha, benzol, bisulphide of carbon, ether, boiling alcohol, and essential oil, one or the other or all of which do not affect the precipitates ordinarily met with in analytical work. The filter is prepared by depositing anthracene in a felt-like condition on the inside of a perforated crucible, after the manner of the preparation of asbestos filters.—*Chem. News*, May 14, 1886, 234—

Filtering Paper—Method for increasing its Tenacity.—To increase the tenacity of filter paper, Mr. Francis draws it through nitric acid, sp. gr. 1.42, and immediately washes with water. When thus treated filtering paper shrinks somewhat and weighs slightly less; it can be washed and rubbed just like linen without losing its filtering properties. A strip of ordinary filtering paper 25 millimeters wide could not support more than 100 to 150 grams, whilst a strip treated with nitric acid supported 1.5 kilograms.—*Amer. Jour. Pharm.*, Mar. 1886, 128; from *Pharm. Zeitung*, 1886, xxxi, p. 19.

Filter Paper—Removal of Traces of Iron. See *Liquor Morphinae Bimeconatis*.

Asbestos Filters—Application.—Mr. A. Convert draws attention to the usefulness of asbestos filters, now to be found in commerce, for many laboratory operations. They are particularly useful for the filtration of strongly alkaline or acid liquids; but they answer equally well for the clarification of the officinal aromatic water, Fowler's Solution, etc., the liquids being first shaken with fragments of the filter material, and then passed through a regularly filled asbestos filter.—*Pharm. Rundschau*, July 1885, 153.

Centrifugal Strainers.—The principle of the centrifugal dryer has lately been again recommended and utilized for operations on the small scale in the chemical and pharmaceutical laboratory. Some of its applications are described and illustrated in *American Druggist* (Mar. 1886, 47); one of them, devised by Bombelon, being particularly applicable to the straining of infusions and decoctions.

APPLICATION OF HEAT, ETC.

Thermometers—Special Construction for Immersion in shallow liquids.—Mr. Chas. Rice has devised a thermometer which is intended for immer-

sion into small quantities of liquids, contained either in capsules or beakers, etc. The peculiarity of the construction consists in shaping the bulb in the form of a coil, and allowing the stem to ascend upright and at right angles from the center of this coil. The thermometer graduated for the author has a stem of six inches in length, and a coil of two inches in diameter. It is graduated from 32° to 120° F. The thermometers of this shape, thus far made, are not intended for temperatures beyond about 125° F., though they could be made to run as high as others should there be any demand for them. The fact that they will stand upright of their own accord makes them very useful in many operations. Accompanying the author's paper is an illustration of the thermometer. The manufacturer is Giuseppe Tagliabue, of New York.—*Amer. Drugg.*, April 1886, 62.

Self-Igniting Bunsen Burner.—Mr. Ernst Doby has devised an improved burner, which has, besides the gas tube proper, a small lateral supply tube ending inside of the globular cap of the burner, and constituting a small, independent burner giving a very small flame, which is prevented from being blown out by accidental drafts, through the globular protection, in the bottom of which there are holes for the admission of air to cause the flame to issue without smoking. When the main stop-cock of the burner is shut off, the small flame remains burning, and causes the re-ignition of the large flame when the supply is turned on again. The flame of the small burner itself may be made larger or smaller by adjusting small screws situated near the base.—*Chem. Zeit.*, 1885, No. 97.

Drying Apparatus—New Construction.—Prof. Victor Meyer describes a form of drying apparatus which he employs when a single vessel is to be successively exposed to varying temperatures, or to a constant temperature obtained by definite liquids. The kettle-shaped apparatus is constructed of copper, and all joints, etc., are hard-soldered. It stands on a tripod, for convenience, and is heated by a gas-burner attached to the apparatus. A glass tube extends upward from the jacket and acts as a condenser. A current of air is maintained in the interior by means of a small tube passing through the jacket from beneath into the interior receptacle for the substances to be dried, and by means of a small hole cut into the lid—or top—of the receptacle, or inner box. The crucible or other vessel may be placed directly upon the bottom of the the inner box, but to keep it clean, a perforated porcelain cylinder may first be introduced.

To produce constant temperatures, the following liquids may be used:

Boiling :	Produces in the interior a temperature of:
Water	206.6° F.
Toluol	224.6° F.
Xylol	276.8° F.
Anisol	302° F.
Tar-Cumol	222° - 323° F.
Naphthalin	302° F. and over.

A sufficient quantity of any of these is introduced into the jacket, and a small flame applied below so that the liquid will boil without the vapor rising more than an inch or so in the condensing tube. This form of apparatus answers not only as a drying oven, but may be used as an oil-bath for many purposes. Whenever possible, it is of advantage to use a separate apparatus for each different kind of liquid. The apparatus is shown in *Amer. Drugg.*, March 1886, 53.—From *Ber. d. D. Chem. Ges.*, xviii., 2999.

Desiccator—Simple Construction.—Mr. Yvon describes a simple form of desiccator, devised by Wiesnegg, which is particularly serviceable for drying small quantities of precipitates, and particularly those of uric acid and albumen. It is readily intelligible without illustration. It simply consists of a rectangular plate of copper, platinized or nickel-plated, about $\frac{1}{16}$ inch in thickness, with a groove along one of the sides in which the thermometer is placed, graduated from 60° to 100° C. (140° to 212° F.) The groove is filled with copper filings so that the thermometer may be in better contact with heated metal. The plate is heated like a sand-bath, or better, on a sand-bath, the heat being regulated either by adjusting the gas stop-cock or some other contrivance, and may be maintained at a uniform temperature without difficulty. The washed filter is first dried upon it and weighed; then the precipitate is transferred to it and washed, and the filter, which may be still moist, laid upon the plate, when it will dry rapidly. The thoroughness with which the washing has been conducted may be recognized from the absence of any stain on the plate, when the filter is removed.—*Amer. Drugg.*, Feb. 1886, 34; *Jour. de Pharm. et Chim.*, 1885.

MISCELLANEOUS SUBJECTS.

Galenic Pharmacy.—An interesting series of lectures relating to the method of producing, and to the characters and some of the properties of a large number of officinally prepared medicines, has been delivered by Professor Redwood, the first of the series being published in *Pharm. Jour. and Trans.* (May 29, 1886, 1010-1013). This, as well as the ones to follow, will be profitable reading for students as well as adepts in pharmacy.

Prescriptions; Ingredients used in fifteen thousand.—Mr. Albert E. Ebert contributes a compilation of the ingredients prescribed in fifteen thousand prescriptions compounded by different pharmacists in Illinois during the same period, which will be found in *West. Drug.*, Feb. 1886, 47-50; from *Proc. Illinois Pharm. Assoc.*, 1885.

Poison Closets.—Mr. August Drescher draws attention to the value of poison closets as a precautionary measure, and gives a list of substances that should be kept in them.—*Pharm. Rec.*, June 1, 1886, 175; from *Proc. New Jersey Pharm. Assoc.*, 1886.

Simple Poison Guard.—Mr. Samuel Constable directs as follows: "Over

the corks or stoppers of all the poisons put a closely-fitting capsule (it can be made of common strong paper), which must be removed before the cork or stopper, thus rendering two operations necessary before the drug can be dispensed."—Amer. Drugg., June 1886, 103; from "Lancet."

Poison Bottles—Safety Appliance.—Mr. Fred. Stockton recommends a safety appliance for poison bottles, which he describes as follows: It consists of two pieces of spring steel or brass, compressed to fit the neck of the bottle and the stopper, and fastened together by a small middle piece with a stamped metal poison label, which serves as a handle in removing the same. It has advantages over anything he has seen, inasmuch as it is easily removed and replaced, and is easy to hold while using the package. Its simplicity will also make it cheap, so that every one may obtain it at a small cost. The appliance is shown by a cut accompanying the author's paper.—Amer. Drugg., March 1886, 41.

Poison Labels.—Mr. John S. Dunn advocates the use of a poison label upon which the antidote to the poison indicated is plainly directed. For this purpose seven forms of labels are required, each giving the antidote to the poisons of one of seven groups, into which the author divides the poisons, the group being indicated by number on the label. The author enumerates the poisons belonging to these groups, and gives precise directions for antidotal treatment, to go on each label.—Proc. Mich. State Pharm. Assoc., 1885, 107-114.

Mr. Dunn's paper, having been referred to a committee, was reported on favorably with some modification, notably in extending the division of the poisons into fourteen groups, and making the directions for treatment on each group-label more explicit.—Ibid. 115-121.

Corks—Method of Rendering them Ether-Tight.—Mr. C. Neumann points out that corks may be rendered ether-tight by chrome-gelatin. It is well known that ordinary corks soon become porous to the vapors of ether, benzol, and other volatile liquids [which gradually carry off every trace of moisture]. By coating the corks with a solution prepared from 4 parts of gelatin, 52 parts of boiling water, and 1 part of ammonium dichromate (added to the *filtered* gelatin solution), and then exposing them for a few days to sunlight, absolutely tight stoppers will be obtained. The apparatus may be put together with unprepared, sound corks, and the exposed portions of the latter afterwards coated and exposed to sunlight. It is well known that gelatin, in presence of bichromates, is also rendered insoluble in water by exposure to light.—Ber. d. D. Chem. Ges., 1885, 3061.

Rubber Goods—Preservation.—Messrs. Kreusler and Budde recommend that rubber articles be immersed in a paraffin-bath heated to 100° C. for a short time, whereby they are prevented from becoming hard and brittle, and are rendered at the same time more durable and air-tight. Small articles are immersed for a few seconds, and larger ones for a few

minutes. They should afterwards be placed into a room where the temperature is about 100° C., whereby the paraffin is made to penetrate the rubber uniformly. After a few hours a sufficient quantity of the paraffin, from 2 to 8 per cent., has been absorbed. To merely preserve rubber articles while in stock for sale, it is sufficient to dip them momentarily in melted paraffin. This coating may be subsequently removed by thoroughly rubbing the articles previously warmed.—*Amer. Drugg.*, Feb. 1886, 34; from *Neueste Erfind. und Erfahr.*

Blotting Paper—Preparation.—The following is suggested in “*La Nature*” for the preparation of a blotter that will not alone absorb ink from paper, but will at the same time remove the stain. Take a thick blotting paper or board, steep it several times in a solution of oxalic acid or oxalate of potassium. Then dry it. If there is a spot to be taken away, apply the blotter, which has been prepared in this fashion, to the same. In proceeding thus, the ink is entirely removed. The blotter drinks up the ink and whitens the paper at the same time.

Paraffin Paper—Use for Enveloping Pharmaceutical Products, etc.—Mr. Van der Berg, after considerable experience, recommends paraffin paper as decidedly superior to all other kinds of wrappers actually in use, in preventing loss of weight, flavor and aroma from contained medicaments and pharmaceutical products in general. Next to paraffin paper came ordinary note paper (writing paper), then parchment paper, and lastly filtering and blotting papers. Doubtless if the paraffin employed has been previously made to dissolve about 1% of salicylic acid a still superior result will be obtained, insuring the absence of mould or mildew.—*Amer. Drugg.*, Jan. 1886, 4; from *Chemist and Druggist*.

Impermeable Wrapping Paper—Formula and Process.—The following is given in “*La Nature*”: Dissolve $1\frac{1}{2}$ lbs. of white soap in a quart of water; then dissolve 2 oz. of gum Arabic and 6 oz. of glue in another quart of water. Mix the two solutions; warm the mixture; dip the paper in the liquid; pass it between two rolls (a clothes-wringer, for example), and put it to dry. In default of rolls, hang the paper up that it may drip well, or, better, pass it between two sheets of dry paper. Then let it dry in a mild temperature.—*Amer. Drugg.*, Feb. 1886.

AQUA.

Aqua Camphoræ—Preparation.—Mr. C. J. S. Thompson observes that, considering how frequently aqua camphoræ is prescribed, it has always been a matter of wonder to him why the present “unpharmaceutical form” in the *Br. Pharm.* has not been superseded by one upon which reliance could be placed as to definite strength and uniformity. The following formula, he states, will always prove satisfactory: Camphor, grs. xx; absolute alcohol, $\mathfrak{m}$ xx; aq. destill., $\mathfrak{z}$ xx. Dissolve the camphor in the alcohol and gradually add the water; shake well, and in a short time

the whole of the camphor will be dissolved.—Pharm. Jour. and Trans. Sept. 26, 1885, 265.

CERATA ET UNQUENTA.

Lanolin—A New Ointment Base.—Lanolin is a cholesterin fat which may be obtained from keratin-holding tissues, such as sheep's wool, hair, feathers, skin and hoofs of horses. Dr. Oscar Liebreich recommends it as a base for ointments superior to glycerin-fats and paraffins, since it is capable of taking up its bulk of water, is with difficulty decomposed, and is very readily absorbed. Its presence is easily ascertained by Liebmenn's test, the solution in acetic anhydride acquiring, on the addition of concentrated sulphuric acid, a rose color changing rapidly to deep blue and green. A 5 per cent. carbolic acid ointment made with lanolin, produced in one or two minutes a feeling of numbness without irritation, and an ointment containing $\frac{1}{1000}$ corrosive sublimate will give the characteristic metallic taste a few minutes after inunction. The proper consistence of the ointments is best preserved by the addition of 5 or 10 per cent. of fat or of glycerin.—Amer. Jour. Pharm., Feb. 1886, 92; from Bert. Klin. Wochenschr., 1885, No. 47.

Lanolin—Tests of Purity.—The following tests for the purity of lanolin are given by Dr. Oscar Liebreich:

1. A small quantity, on being heated in water over a water bath, must show the absence of glycerin.
2. If a solution of caustic soda be added, ammonia must not be developed.
3. If a small amount be heated with water on a water-bath, the fat must separate in oily drops without producing an emulsion. If the quantity employed be large, it must separate as a clear oil.
4. With litmus-paper the reaction must not be acid.
5. When well mixed with water upon a ground-glass plate with an iron spatula, the product must contain over 100% of water and the mass be sticky and paste-like, adhering to the spatula; if impure, the mass will have a soap-like smoothness from which the spatula readily glides.
6. On exposure, the surface of lanolin and lanolin-salves becomes darkened, owing to escape of water and not to decomposition.
7. It never becomes rancid and its odor should remind one of wool.—Amer. Drugg., June 1886, 108.

Lanolin—Absorption of Water as Compared with other Ointment Bases, etc.—Mr. E. Dieterich, with a view of determining the quantity of water taken up by different salve bases, experimented with 21 different bases at a temperature of 15°C., taking for each experiment 100 parts of the base; his results were as follows: Cosmoline took up 4 parts of water, lard 15, benzoinated lard 17, and lanolin 105. The remaining bases were mixtures of either almond oil, olive oil, linseed oil, cod liver oil, or oleic acid with

either lard, wax, resin, suet, or spermaceti. White wax took up more water than yellow wax, probably due to the acid it contains. A mixture of 70 parts of oleic acid and 30 parts of white wax took up 60 parts of water, whilst a mixture of yellow wax and oleic acid in the same proportions took up but 50.5 parts of water.

Lanolin, as it now appears in the market, is a perfectly neutral base, and hence is not apt to decompose any medicament which might be added. Lassar experimented with it on 400 patients, and states that lanolin is readily absorbed by the skin, does not produce any irritation, and permeates the lower layers. Bachmann rubbed a 10 per cent. iodide of potassium ointment, made with lanolin, into the skin for five minutes; after a lapse of half or three-quarters of an hour, iodine was detected in the urine. The elimination of the iodide by the urine continued for 14 days after several applications of the ointment. Lanolin was used by the ancients, and is mentioned by Ovid, Herodotus, Plinius and Aristophanes. Under the name of *cesypum* it is mentioned in the Florentine Pharmacopœia of 1560.—*Amer. Jour. Phar.*, Feb. 1886, 101; from *Rundschau*, No. 52, p. 825.

Lanolin—Formulas for Various Preparations in which it is Useful.—Dr. O. Liebreich suggests the following formulas: 1. Nitrate of silver, 1; lanolin, 9. 2. Carbonate of lead, 30; lard, 10; lanolin, 60. 3. Lead plaster, 50; olive oil, 20; lanolin, 30. (This salve appears solid, but when applied to the skin it becomes mobile. When used for eczema, the water it contains should be evaporated with the aid of heat.) 4. Lead plaster, 1; lanolin, 1. 5. Ammoniated mercury, 10; lard, 10; lanolin, 80. 6. Mercuric oxide (yellow?), 10; lanolin, 90 (30% of lard should be added when this is used for the eyelids). 7. Solution of subacetate of lead, 8; lard, 10; lanolin, 80. 8. Oxide of zinc, 10; lard, 10; lanolin, 80. 9. Red sulphide of mercury, 10; lard, 10; lanolin, 80. 10. Iodide potassium, 20; water, 10; lard, 20; lanolin, 150. 11. Spermaceti, 10; olive oil, 30; lanolin, 40; rose water, 50. 12. Iodoform, 10; lard, 10; lanolin, 80. 13. Chrysarobin, 10 to 20; lard, 10; lanolin, 80. 14. Tar, 20; lanolin, 80. 15. Balsam of Peru, 10; oil of turpentine, 20; lanolin, 70. 16. Boric acid, 10; lard, 20; lanolin, 70. 17. Carbolic acid, 5; lard, 5; lanolin, 90. 18. Salicylic acid, 10; lard, 20; lanolin, 70. 19. Naphthol, 5; lard, 10; lanolin, 85. 20. Lanolin, 50; lard, 5; oil of rose, 3 *grains*.—*Amer. Drugg.*, May 1886, 99.

In the same number of "*Amer. Drugg.*" a number of formulas for ointments is given by Messrs. Jaffé and Darmstaedter, in which the usual ointment base is wholly or in part substituted by lanolin.

Agnine—A Pure Form of Wool-Fat.—Mr. Frank A. Davidson draws attention to the methods for abstracting the fat from sheep-wool without injury to the wool itself, and makes some general remarks on the character and uses of "*Agnine*," a pure form of wool-fat.—*Proc. Mass. State Pharm. Assoc.*, 1886, 179-184.

Non-Fatty Ointment Base.—Unna recommends 10 parts of gelatin and 40 parts each of water and glycerin as a substitute for fats in making zinc ointment.—Pharm. Jour. and Trans., Aug. 22, 1885, 172; Edin. Med. Jour., Aug. 1885.

Benzoated Lard—Preservation.—Mr. Charles Khuen has prepared benzoated lard in different ways, and found that all the samples that had been exposed in the store from October to May, at a mean temperature of 62° F., were spoiled, whilst those kept in the cellar, at an average temperature of 38° F., kept well. He advises that it be kept at a mean temperature of 40° F.—Proc. N. Y. State Pharm. Assoc., 1886, 172.

Veloporphyre—A new Pharmaceutical Apparatus particularly suited for Mixing Fatty Bodies.—Mr. B. Giraud describes a new apparatus, which he has named "*veloporphyre*" which is particularly intended for the intimate mixing of fatty bodies. It is a hollow cylinder in shape of a crown completely closed, capable of being turned vertically on its axis, and containing in its interior a heavy solid ball. For a description of the details of construction reference must be had to the illustrated paper as translated in "*Western Druggist*," Feb. 1886, 39-40, from *L'Union Pharm.*, Jan. 1886.

Officinal Ointments—Criticisms and Suggestions.—Mr. R. Rother contributes a paper on several officinal ointments in which he criticises the different ointment bases as well as ointments and offers suggestions as to their improvement. Speaking of *benzoin* as a preservative for fats, the author remarks that it imparts an unpleasing discoloration to fats, and owing to its disposition to become hardened by heating, it is not readily extracted by the melted lard. He has found *balsam of tolu* not alone to take the place of benzoin, but to be superior, not alone by reason of its ready fusibility, but also because its chief constituent—cinnamic acid—is a more powerful antizymotic than benzoic acid. Ordinary *resin*—usually called rosin—gives durability to ointments, and need not be employed to the extent of more than 1 %. *Stearic acid*, known in commerce as hard stearin, forms a hardening body for the softer fats, that is far superior in many respects to wax or spermaceti. *Paraffin*, also, serves an excellent purpose as a substitute for white wax. Then the author proposes *Ointment of Iodide Potassium* with a fat obtained by fusing together 3 parts each of paraffin and lard, gradually adding 18 parts more of lard, and then setting aside. To this body the solution of iodide of potassium and hyposulphite of sodium is then added before complete congelation. A mixture of petrolatum and stearic acid is also proposed.

Ointment of Oxide of Zinc is best prepared as follows:

Zinc oxide	4 troy ounces.
Starch, pulverized	$\frac{1}{2}$ " "
Spermaceti	$\frac{1}{2}$ " "
White wax	1 " "
Lard	14 " "
Balsam tolu	120 grains.

Triturate the oxide of zinc with about three-fourths of the powdered starch, and sift the mixture with a No. 80 sieve. Rub the coarse portion remaining on the sieve with the rest of the starch, and pass it all through the sieve. Melt the wax and spermaceti with half an ounce of the lard, and then gradually add the remaining lard. Now add the balsam to the fused fat and apply heat for 15 to 20 minutes, not exceeding 60°C. of temperature, and then decant the fluid portion. Pour this gradually upon the zinc oxide mixture, stirring it well meanwhile, and when all the fused medium has been incorporated, stir the mixture occasionally until the ointment stiffens.

With the use of stearic acid the balsam can be omitted, and the proportions will be: Zinc oxide 4 troy ounces, starch $\frac{1}{2}$ troy ounce, stearic acid 1 troy ounce, and lard $14\frac{1}{2}$ troy ounces. The manipulation is essentially like that of the preceding process.

With white petrolatum a magnificent ointment is produced; but owing to the relatively greater cost of the fatty medium, the ointment becomes too expensive for general sale.

Mercurial Ointment, the author thinks, may well be left to the manufacturer, since it is more correctly made by the aid of machinery than in the hands of the pharmacist. It should suffice for the Pharmacopœia to establish a standard of strength, and this should not exceed 25 per cent. since ointment of that strength is usually vended. Suet should be omitted from this ointment, and replaced by some less hard and less odorous fat. Finally the author offers the following formula for

Ointment of Mercuric Nitrate:

Red mercuric oxide	1 troy ounce.
Nitric acid	1 " "
Water	180 minims.
Stearic acid	$3\frac{1}{2}$ troy ounces.
Petrolatum	$10\frac{1}{2}$ " "

Mix the mercuric oxide with the water and gradually add the nitric acid, with constant stirring. Should some of the oxide have become hardened, rub it into powder, and gently warm the mixture until perfect solution has resulted. Melt the stearic acid with $3\frac{1}{2}$ troy ounces of the petrolatum, and then gradually add the rest of the petrolatum. To the fused mixture now add the mercuric solution, and warm the whole on a water

bath for 10 to 15 minutes. Finally, permit the ointment to cool, and stir it occasionally while stiffening.—*Amer. Jour. Pharm.*, Jan. 1886, 1-9.

Petroleum Ointments—Commercial Quality.—Mr. J. B. Duble has examined the petroleum ointments of the market, and gives a detailed description of those examined. His results show that the cheaper preparations compare favorably with those held at a higher price, and that a proper selection may be made with ordinary care.—*Proc. Penna. Pharm. Assoc.*, 1886, 200-202.

Paraffinum Molle, B. P.—Unpleasant Effects when Administered Internally.—Mr. H. S. Robinson states that he was called to see three children, aged from eight to fourteen years, who, on the previous evening, had each been given about half a teaspoonful of one of the paraffin preparations on sugar, because they were suffering from sore throat. Soon afterwards they were seized with pains in the knee and cramps of the lower extremities, together with severe vomiting, which continued from eight to nine hours. There were no febrile symptoms, and the children afterwards quickly recovered their usual health. Inquiry at the shop where the article had been purchased showed that the paraffin preparation used had been taken from a jar labelled "Paraffinum molle, B. P."—*Pharm. Jour. and Trans.*, February 27, 1886, 724; *Brit. Med. Jour.*, February 13, 1886, 296.

Citrine Ointment—Modification of Official Formula.—Mr. H. Cook makes some practical observations on the manipulation requisite to insure uniformly a nice product by the official formula, which he considers perfectly satisfactory. The only modification that he considers advisable is in the manipulation and as to the employment of heat. Seventy-six (76) parts of lard oil were placed in a capsule, and seven parts of nitric acid having a specific gravity of 1.42 were added without stirring, and the two heated to about 50° Centigrade for about fifteen minutes, then gradually elevating the temperature to about 70° Centigrade, and maintaining this temperature until the slight effervescence ceased, and the mixture had acquired a rich orange color, indicating that the nitrous compounds had acted upon the olein in the oil, and the reaction had resulted in the production of elaidin, which is one of the valuable constituents of the ointment. When this mixture had become almost cold, the solution of nitrate of mercury was added, and then stirred with a wooden spatula till a homogeneous ointment, having a bright butter color, was formed. An ointment so made was found to retain its bright color longer than one made by heating the oil first to 70° C., after the official directions.

The author has also made some experiments as to the adaptability of petrolatum for the preparation of this ointment, but concludes that its use is both unscientific and impracticable.—*Proceedings Ohio State Pharm. Association*, 1885.

Carbolic Ointment—Preparation with Petrolatum.—Mr. R. Rother observes that several years ago he prepared some carbolic ointment by replacing the simple ointment with petrolatum and melting this together with carbolic acid in officinal proportion. The result differed from the officinal in a very pronounced manner, since the causticity of the phenol was not perceptibly diminished. On mixing this ointment with an equal amount of the officinal article, a superior product was obtained.—*Drugg. Circ.*, Jan. 1886, 5.

Ointment of Phosphide of Zinc—Formula.—Mr. Pierre Vigier suggests the following formula for an ointment of hydrated sulphide of zinc (see “Inorganic Chemistry”): Triturate zinc sulphide, 1 p., with expressed oil of almonds, 1 p., and mix with lard (or cerate) 8 parts.—*Amer. Jour. Pharm.*, June 1886, 294; from *Gaz. Hebdom. Med. Chir.*, February 5, 1886.

Ointment of Subsulphate of Mercury—Formula.—This ointment, which is recommended as a local application in certain syphilitic affections, is directed by Mauriac to be prepared of turpeth mineral 2 to 3 parts and lard 30 parts.—*Amer. Jour. Pharm.*, February 1886, 104; *Med. News*, January 2, 1886.

Ointment of Quinine—Preparation with Lactate of Quinine. (which see under “Organic Chemistry.”)

Ointment for Sore Nipples—Formula.—Dr. Groussin recommends for application to sore nipples in nursing women an ointment composed of equal parts of white sugar, oxide of zinc, gum arabic, and glycerin.—*Amer. Jour. Phar.*, September 1885, 437; from *N. Y. Med. Jour.*, June 20, 1885.

Maury's Ointment—Formula.—Dr. Maury introduced an ointment into the Philadelphia Hospital, for the external healing treatment of sores, ulcers, etc., which Mr. Joseph W. England now draws attention to. The following is a modified formula—petrolatum being substituted for simple cerate:

R. Nitrate of mercury ointment	3j.
Powdered rhubarb.	
Powdered opium	aa. 3ss.
Petrolatum	q. s. ad 3j.

Triturate the rhubarb and opium together with the petrolatum, until a perfectly smooth, homogeneous product is obtained. Then admix with it the citrine ointment, after having previously rubbed the same with about one fluidrachm of glycerin to remove any granulation present, using in the latter action a bone spatula to work with.—*Amer. Jour. Pharm.*, February 1886, 84–85.

Camphor Cerate—Insufficiency of Camphor.—Mr. Charles A. Heinitsch

observes that the camphor cerate, in its present strength, might well be omitted from the Pharmacopœia, its use for the preparation of cerate of subacetate of lead not justifying its retention. On the other hand, a preparation containing a large percentage of camphor, from 10 to 20 or 30 per cent., might prove a desirable preparation, and is sometimes prescribed or called for.—Proc. Penna. Pharm. Assoc., 1886, 152.

Cerate of Subacetate of Lead—New Formula.—Mr. James Kennedy recommends the following formula as furnishing extemporaneously a more satisfactory preparation than that obtained by the officinal process. Take of crystallized subacetate of lead (see under Acetic Acid elsewhere), 5 parts; glycerin, 20 parts; camphor liniment, 5 parts; simple cerate, 70 parts. Dissolve the salt in the glycerin with the aid of heat; allow to cool, add the camphor liniment, and thoroughly incorporate with the cerate.—Pharm. Rec., Febr. 15, 1886, 50.

Sulphur Ointment—Dr. Fournier's Formula.—The ointment largely used in France in the treatment of scabies, etc., known as Fournier's ointment, from the name of Dr. Fournier, who first prescribed it, is made as follows: Sodæ carb., $1\frac{1}{2}$ ounces; sublimed sulphur, 3 ounces; gum tragacanth, 15 grains; glycerin, 6 fluidounces. It is said to be less irritating than most other compound sulphur ointments. The pure English sulphur ointment, which consists simply of flour of sulphur and lard, has no irritating action whatever, and is found to be quite as effective as many compound ointments, which, like the above, contain either an alkaline sulphide, or a mixture of sulphur with some alkaline substance.—Amer. Drugg., Nov. 1885, 216.

Unguentum Diachylon—New Formulas.—From the large number of formulas for ointments containing lanolin as the base, which have been published in German journals, the following for diachylon ointment are selected as examples by Mr. H. Ochse:

1. Lead plaster, 50; olive oil, 20; lanolin, 30. Mix.
2. Lead plaster, 45; lanolin, 45; lard, 10. Mix.

ELIXIRS.

Simple Elixir—Practical Suggestions.—Mr. R. Rother recommends calcium carbonates as preferable to magnesium carbonate or absorbent cotton for facilitating the solution of oily aromatics, and makes some practical remarks in reference to simple elixir. The process for preparing a simple elixir, and essentially most compound elixirs likewise, is based upon certain practical principles demanding at least average attention. The best results are invariably secured by combining the aromatic with the completed menstruum. This is effected by first dissolving the sugar in all the available water and then adding the alcohol; then thoroughly triturating the oils with the calcium carbonate, and gradually adding the menstruum, with constant stirring, until one-sixteenth to one-twelfth has been added;

the resulting mixture is then poured into the remaining menstruum, and the whole well shaken at occasional intervals during a period of several hours, and finally filtered. The first small portions of the filtrate are apt to contain a trace of turbidity due to minute particles of calcium carbonate. The remainder, however, passes beautifully clear and bright, and with acceptable rapidity. The solution resulting from 48 troy ounces of sugar and 4 pints of water measures about $6\frac{1}{4}$ pints. The addition of one and a half pints of alcohol increases this to about $7\frac{3}{4}$ pints, so that after filtration the measure of one gallon is completed by adding water through the filter.—*Amer. Jour. Phar.*, Oct. 1885, 479.

Elixir of Calisaya—Preparation from the Bark.—Mr. W. W. Granger prepares elixir of calisaya as follows: Take of cinchonæ cort. flav. (No. 60 powder), 2 ozs 320 grains; moisten thoroughly with sufficient of a mixture of 2 pints of water and 5 drachms of muriatic acid, and allow to stand 24 hours; then pack into a percolate and exhaust with the remainder of the dilute acid. Precipitate the percolate with solution of soda, and thoroughly wash the precipitate with water. Dissolve the precipitate by the aid of acetic or citric acid in sufficient water to make one pint, and carefully neutralize with ammonia, then add alcohol 7 ozs.; syrup, 8 ozs.; spirit of orange peel, 1 oz.; mix and color with caramel. The clear elixir so produced is perfectly compatible with iron preparations.—*Pharm. Rec.*, Dec. 15, 1885, 413.

Compound Elixir of Quinine—Preparation.—Mr. R. Rother offers the following formula for preparing a Compound Elixir of Quinine to take the place of "Elixir of Cinchona:"

Cinchonium Sulphate	250 grains.
Quinium	145 "
Cinchonidium	128 "
Calcium hypophosphite	114 "
" carbonate, precipitated	1 troy ounce.
Oil of anise	8 minims.
" caraway	16 "
" Ceylon cinnamon	16 "
Sugar, granulated	48 troy ounces.
Alcohol,	
Water	of each sufficient to make 1 gallon.

Dissolve the sugar in 4 pints of water and add 18 fluidounces of alcohol. Rub the oils thoroughly with the precipitated calcium carbonate, and then gradually add, with constant stirring, 8 to 10 fluidounces of the preceding mixture. Pour this now into the remainder of the saccharine solution and set the mixture aside, shaking it up frequently; then after an interval of about two hours filter it, returning the first turbid portion, and when all has passed through, follow with water until the filtrate measures $7\frac{1}{2}$ pints. Upon the calcium hypophosphite pour 2 fluidounces

of water and warm the mixture on a water-bath. Now add the sulphates of the alkaloids, and when double decomposition is complete remove the mixture from the water-bath and gradually add 4 fluidounces of alcohol; then pour it into a small filter, and when all the liquid has passed through, follow with alcohol until the filtrate measures 8 fluidounces. Then pour this into the simple elixir first obtained and mix the whole. The author also proposes the following formula for an

Elixir of Iron, Quinine and Strychnine, in which the bases are held in solution as hypophosphites:

Ferric citrate	261 grains.
Quinium sulphate	140 "
Sodium hypophosphite	68 "
Calcium "	28 "
" carbonate, precipitated	60 "
Strychnine, powdered	2 "
Oil of anise	1 minim.
" caraway	2 minims.
" Ceylon cinnamon.	2 "
Sugar, granulated	6 troy ounces.
Alcohol.	
Water	of each sufficient to make 1 pint.

Dissolve the sugar in seven fluidounces of water, and add one and a half fluidounces of alcohol. Rub the oils thoroughly with the precipitated calcium carbonate, and then gradually add, with constant stirring, one to one and a half fluidounces of the preceding mixture. Pour this now into the remainder of the saccharine solution and set the mixture aside, shaking it up frequently; then after an interval of about two hours filter it, returning the first turbid portion, and when all has passed through, follow with water until the filtrate measures 13 fluidounces. Upon the calcium hypophosphite pour half a fluidounce of water, and warm the mixture on a water-bath. Now add the quinium sulphate, and when double decomposition is complete remove the mixture from the water-bath and gradually add one fluidounce of alcohol; then pour it into a small filter, and when all the liquid has passed through, follow with alcohol until the filtrate measures two fluidounces. Then pour this into the simple elixir first obtained and mix the whole. Mix the ferric citrate, sodium hypophosphite and one fluidounce of water, and apply heat until complete solution has occurred. Now pour the elixir of quinium hypophosphite, previously finished, into this solution, and if necessary add water to the measure of a pint and mix the whole; then add the strychnine, and when this has dissolved filter the elixir if necessary.

The author remarks that when employing a commercial article of ferric citrate in the preparation of elixirs especial care must be exercised not to use the so-called soluble kind, as this is merely the ammonio-citrate.

Further care should also be had not to select a ruby-tinted kind appearing in flat scales having an equilateral tendency. This is also a hydro-citrate, containing alkali, and hence of indefinite composition. The normal ferric citrate has a garnet tint and occurs in curved oblong scales; it is the only proper form to employ.—*Amer. Jour. Pharm.*, Oct. 1885, 477-483.

Elixir of Pepsin and Bismuth—Formula.—As the result of a very exhaustive study of relations of pepsin and of sodio-bismuthic tartrate to each other, with special reference to their exhibition together in pleasant liquid form, Mr. R. Rother proposes the following formula for an Elixir of Pepsin and Bismuth:

Pepsin, saccharated	100 grams.
Bismuth subnitrate	10.5 "
Strychnine	.21 "
Chlorhydric acid, diluted	12.5 f. grams.
Alcohol	50 "
Glycerin	200 "
Orange flower water	200 "
Nitric acid,	
Tartaric acid,	
Sodium bicarbonate,	
Water	of each sufficient to make 800 fluidgrams.

Mix the bismuth subnitrate with 40 fluidgrams of water, and gradually add nitric acid, with constant stirring, until a clear solution is obtained. To this now add 7.65 grams of tartaric acid and 80 fluidgrams of water. The solution is then treated with sodium bicarbonate until about three-fourths of the nitric acid is neutralized. The crystalline magma of bismuth tartrate is now poured upon a plain filter and washed with water till practically free from nitric acid. Now mix 2.9 grams of sodium bicarbonate with 5 fluidgrams of water, and gradually add 2.55 grams of tartaric acid. With this solution mix the washed bismuth tartrate, and stir them together occasionally until a clear solution has resulted.

Mix the diluted chlorhydric acid with water to the measure of 200 fluidgrams, and add the orange flower water. Pour this mixture upon the saccharated pepsin, and transfer the resulting magma to a bottle having double the capacity; cork it well, and immerse it in a water-bath having a constant temperature of 40°C. for the time of one hour, shaking the bottle at intervals. Pour the resulting pepsin solution into a beaker, or graduated measure, and add sodium bicarbonate until neutralization is effected. To this liquid then add the solution of bismuth sodio-tartrate, and carefully follow with more sodium bicarbonate until the gelatinous precipitate which had formed is redissolved. Now incorporate the strychnine and 2 grams of tartaric acid; transfer the solution to a filter, returning the first turbid portions that pass, and when all the liquid has passed through, follow with water, if necessary, through the filter, so that the filtrate measures 550 fluidgrams. To this now add the alcohol and

glycerin previously united, and mix the whole.—*Amer. Jour. Pharm.*, Sept. 1885, 417-425.

Elixir of Coca—Formula.—Mr. Llewellyn H. Lewis suggests the preparation of an Elixir of Coca so that a pint represents the virtues of four ounces of the leaves. The leaves are powdered and percolated with a mixture of 3 parts of alcohol and 1 part of water, until $11\frac{1}{2}$ fluid ozs. of tincture are obtained, to which is added a solution of oil of orange 6 drops, and oil of cinnamon 2 drops, in $\frac{1}{2}$ fluidounce of alcohol, and afterward 4 fluidounces of simple syrup.—*Amer. Jour. Pharm.*, Mar. 1886, 118; from the author's thesis.

Elixir of Hyponone—Formula.—Mr. Vigier suggests an *elixir*, prepared in the following proportion: hyponone 1 drop, alcohol (60 per cent.) and syrup of peppermint, of each 3 grams.—*Amer. Jour. Pharm.*, Feb. 1886, 105; from *Gaz. Hebd.*

EMPLASTRA.

Impermeable Russian Plaster—Methods of Preparation.—Mr. Eugen Dietrich communicates the following formula and process for preparing Impermeable Russian Plaster: Rub 5 p. oxide of zinc with 5 p. castor oil to a perfectly smooth paste, mix with 90 parts of collodion, and pour this mixture, in the same way as photographers do, upon plates of glass, and repeat the process until the layer has acquired the thickness of gold-beater's skin. Next coat the surface of the layer with solution of isinglass, allow to dry, and strip the layer from the glass.

This plaster is used (with the isinglass coat next the skin) as a dressing in place of ordinary adhesive plaster.

When preparing larger quantities, the mass is poured into a trough and the plate dipped in it. In this case a uniform coat can be obtained only by immersing the plate each time by a different edge first.—*Amer. Drugg.* Sept. 1885, 176; from *Pharm. Centralb.*, 1885.

ESCHAROTICA.

Cauterizing Crayons—New Formula.—Dr. Moser recommends cauterizing crayons to be prepared from charcoal 40, potassium nitrate 5, porphyrized iron 5, powdered benzoin 1, and sufficient mucilage. After drying, these crayons are firm, light easily, and produce immediate cauterization.—*Amer. Jour. Pharm.* Feb. 1886, 104; from *L'Union Méd.*

EXTRACTA.

Pharmaceutical Extracts—Occurrence of the Penicillium Ferment.—Mr. E. Cocardas describes the various forms of "Penicillium-Ferment" grown in different pharmaceutical extracts, and arrives at the conclusion that the ferment causes in the extract changes comparable to those effected by heat, viz., the absorption of oxygen and disengagement of carbonic

acid, with formation of water. The exact chemical changes are, however, complex, and vary with the special extract. The "*Penicillium*" itself is subject to a series of variations, but all are varieties in the evolution of a single form. The original paper is accompanied by illustrations.—*Pharm. Jour. and Trans.*, Jan. 9, 1886, 590; from *Bull. de la Soc. Botanique de France*.

Exsiccated Narcotic Extracts—Diluent.—Soluble starch, made by boiling 1000 parts of potato starch with 5000 parts of water and 20 parts of oxalic acid until the mixture becomes clear, then neutralizing with chalk, is recommended as a diluent for narcotic extracts. Powdered soluble starch resembles gum arabic, is soluble in water, and contains but a trace of glucose.—*Pharm. Rundschau*, xii, p. 89.

Extract of Belladonna Root—Estimation of Total Alkaloid.—In a previous paper (see *Proceedings* 1884, 134), Messrs. Wyndham Dunstan and Francis Ransom have given a method for the accurate determination of the quantity of alkaloid in belladonna root. The authors now present a method for the determination of the total alkaloid in the extracts of belladonna root of commerce, which is a modification of that previously recommended. It consists in dissolving about 2 grams of the extract by the aid of gentle heat, in water acidulated with hydrochloric acid, and filtering the liquid, washing the residue with acidulated water until a precipitate is no longer produced with solution of iodine in iodide of potassium, rendering the liquid alkaline with ammonia, and extracting by repeated shaking with chloroform; two separate extractions with one-half its volume of chloroform being usually sufficient. The chloroform is next agitated with its own volume of water acidulated with hydrochloric acid, the aqueous solution is separated, again rendered alkaline with ammonia, and shaken out twice with half its volume of chloroform. The chloroform is now evaporated and the residue dried to constant weight at 100° C. The authors have convinced themselves that this residue is entirely alkaloidal and represents the total atropine and hyoscyamine contained in the sample. A number of commercial extracts of belladonna root were examined by this method, with the following results:

Number of Extract.	Per cent. of Alkaloid in Normal Extract.	Per cent. of Water in Normal Extract.	Per cent of Alkaloid in Dry Extract.
1	1.75	16.0	2.08
2	1.85	21.4	2.36
3	3.00	16.8	3.60
4	4.45	21.6	5.67
5	3.20	20.0	4.00
6	3.65	16.8	4.40
7	3.00	16.0	3.55
8	3.60	16.0	4.28
9	1.65	17.7	2.04

An extract was prepared from a specimen of root, containing about 0.3 per cent., of alkaloid with alcohol alone, and another by the method of the British Pharmacopœia. The first contained 2.8 per cent., of total alkaloid, whilst that made by the B. P. method contained only 1.7 per cent. Hence it is clear that in order to prepare extracts that shall be uniform in alkaloidal strength it is necessary to determine the kind and quantity of solvent which shall be used. *Phar. Jour. and Trans.*, Mar. 13, 1886, 177.

Extract of Belladonna Leaves.—Determination of alkaloidal strength.—Messrs. Wyndham Dunstan and Francis Ransom, in endeavoring to determine the alkaloidal strength of alcoholic extract of belladonna leaves, encountered considerable difficulties owing to the large amount of fatty matter, chlorophyll, etc., present. They finally succeeded by modifying the process adopted by them for the assay of belladonna leaves (which see under “*Materia Medica.*”) One to two grains of the extract is warmed with dilute hydrochloric acid until as much as possible is dissolved. The mixture is filtered, preferably through cotton-wool, and the residue washed with hot dilute hydrochloric acid until nothing further is dissolved. The acid liquid is then repeatedly agitated with chloroform so long as anything is removed by that solvent, and it is then further treated as in the process above referred to. Comparative experiments made with samples of extract showed that the results are very accurate. A carefully prepared specimen of extract was found to yield 1.8 per cent., of total alkaloid (*i. e.* atropine and hyoscyamine).—*Yearbook of Pharm.* 1885, 394-395.

Extract of Belladonna.—Determination of Alkaloid.—Mr. H. Kunz has made numerous experiments with a view to determine the alkaloid in extracts of belladonna, keeping in view the importance of isolating the same in the purest possible form, with the least possible loss, and to prevent change at the least possible temperature. His results lead him to recommend the following method: An aqueous solution of the extract prepared with cold water is mixed with ten times its volume of 96% alcohol to separate colloidal substances, which by their presence interfere with the subsequent shaking out with ether or chloroform. The mixture is allowed to stand until the precipitate has subsided, and the alcoholic solution filtered; the residual colloidal matter is dissolved in the smallest possible quantity of water and treated with alcohol as before, and this treatment is repeated four or five times, until the alcoholic washings no longer give indications of the presence of alkaloid. The amount of colloidal substances thus separated amount to 14 to 34% of the extract, according to the condition of the latter. The united alcoholic filtrates are now distilled *in vacuo* at a temperature of 50° to 60°, and the residue is exposed to spontaneous evaporation to secure the removal of all the alcohol. The syrupy, brown-red liquid is rendered alkaline with carbonate

of potassium, and shaken repeatedly with ten times its volume of ether, so long as the latter takes up alkaloid. This process takes place rapidly and precisely, the two layers separating very readily. Four or five treatments with ether usually suffice, but under all circumstances the treatment must be continued as long as the ether gives evidence of alkaloid. The last traces of alkaloid are removed from the aqueous fluid by shaking several times with chloroform. The united ether solutions are now distilled to dryness at not exceeding 40° C. ; the chloroformic solutions spontaneously by a rapid current of dry hydrogen gas. The united residues remaining after the evaporation of chloroform and ether are now taken up by repeated small portions of water, acidulated with sulphuric acid, whereby traces of chlorophyll and fat are removed, and the filtrates, being rendered alkaline with ammonia, are shaken repeatedly with five times the volume of chloroform. The chloroform is distilled off, the residue is evaporated, and finally dried in an exsiccator to constant weight. The author gives examples which seem to prove the correctness of his method.—*Arch. d. Pharm.*, Sept. (2), 1885, 701-709.

Extract of Nux Vomica—Yield and Alkaloidal Strength.—Dr. A. B. Lyons reviews the determinations that have been made at different times of the amount of alkaloids contained in extract of nux vomica, and of the amount of extract obtainable from nux vomica by alcoholic menstrua of different strength, and communicates the results of his own experiments made in the same direction. The experiments are made particularly with a view to determining in how far the officinal directions, requiring the

Tincture of Nux Vomica to contain 2% of extract, secures a preparation of uniform strength. The results of Dr. Lyons are as follows:

Sp. Gr. of Menstrua.	Per cent. (volume) of Com. Alcohol.	Per cent. of Extract from Drug.	Per cent. of Alkaloid in dry Extract.	Per cent. of Alkaloid Extracted from Drug.
0.9400	50	14.1	16.6	2.21
0.9080	67	13.5	19.3	2.60
0.8891	75	12.1	15.0	1.82
0.8508	90	8.3	18.6	1.50
0.8200*	100*	6.9	32.0	2.20

* Alcohol containing water of ammonia, .5 per cent.

The author concludes that these preparations—the extract and tincture—should be standardized as recommended by Messrs. Dunstan and Short (see *Proceedings* 1884). The details of Dr. Lyons' paper are highly interesting, and may be consulted in *Proc. Mich. St. Pharm. Assoc.* 1885, 172-185.

Prof. John M. Maisch has read a paper pertinent to the same subject, which see in *Proc. Penn. Pharm. Assoc.* 1886, 138-140.

Extract of Belladonna—Test for Sophistication.—Dr. Schweissinger communicates a test for determining the sophistication of extract of belladonna—*extractum graminis*, *extractum taraxaci*, *extractum dulcamaræ*, and dextrin being most frequently used in Germany for this purpose—which is based on the assumption that belladonna leaves contain no substance capable of reducing Fehling's solution. In no case where an undoubtedly genuine sample has been under examination has any reducing substance been detected, or at most only a minute quantity. The test is applied by heating 1cc. of Fehling's solution diluted with 4cc. of water to a temperature of 60° to 70° C., and adding 5 centigrams of a solution of one part of the extract in four parts of water. In the case of a genuine extract the blue color passes to a light green or light brownish green, and this color is said to remain for hours, or even days, unaltered. If the extract has been sophisticated there is at first a reddish turbidity, and eventually a considerable red deposit of cuprous oxide. In some instances, also, of probably genuine extracts, there has been noticed, after a time, a small greenish deposit.—Pharm. Jour. and Trans., Feb. 27, 1886, 723; Pharm. Ztg., Feb. 18, 1886, 101.

Referring to the above paper, Dr. Schweissinger states that since its publication he has seen two undoubtedly genuine extracts of belladonna that distinctly reduced the solution, though only slightly as compared with the influence of a sophisticated extract. But even in these cases he thinks that the reducing action is referable to unfavorable conditions to which the extracts had been subjected either in the making or keeping. The author has also experimented as to the possibility of extending the test to

Extract of Digitalis, after first removing the glucosides. Using an extract that had been carefully prepared in vacuo, 0.1 gram was dissolved in 10 grams of cold water, about ten of a freshly prepared 10% solution of tannic acid added, the liquid after standing for a time filtered, the filtrate treated with slight excess of lead acetate and again filtered. This filtrate did not reduce Fehling's solution, but other genuine extracts, treated in the same manner, did exercise a reducing action, and that in proportion apparently to the degree of heat to which they had been subjected in their preparation. The author's supposition that this was due to the splitting up of the glucosides under the influence of heat was confirmed by experiment. The experiments of the author have an important bearing, not alone upon the care necessary to be exercised in the preparation of digitalis extract, but also upon possible methods for determining change in other complex preparations containing glucosides, but no sugar.—Pharm. Jour. and Trans., April 3, 1886, 839; Pharm. Ztg., Mar. 17, 1886, 168.

Extract of Opium.—Strength of Commercial Specimens.—Mr. W. P. Want has determined the strength of six specimens of extract of opium

with the following results, two separate assays (A and B) being made of each example:

Percentage of Morphine	1	2	3	4	5	6
A.	19.997	9.93	18.27	14.29	18.76	20.37
B.	19.87	10.05	18.36	14.35	18.89	20.28

It will be observed that only two of the specimens were of the strength required by the B. P., viz., 20 per cent.—Pharm. Jour. and Trans., May 15, 1886, 959.

Malt Extracts—Determination of Diastatic Value.—Dr. J. R. Duggan observes that many of the determinations of diastase in malt extracts that have been made heretofore are undoubtedly erroneous, owing to the fact that certain precautions which are essential to correct results have not been generally observed. These may be stated, in brief, to consist in the use of perfectly neutral reagents, and such an excess of starch that not more than one-third is converted into maltose. Moreover, the extent of conversion is better determined by the amount of sugar formed, than by the time required to show a certain color with iodine. The use of iodine as an indicator for starch in the presence of dextrin is very unreliable, the color produced being dependent on the amount of iodine added, the temperature of the solution, and various conditions other than the extent of conversion. The author suggests the following method for the determination of the diastatic value of malt extracts:

A 3 per cent. starch paste is made by adding a weighed quantity of Bermuda arrowroot to distilled water, and heating the mixture to gelatinization in the water bath. A flask containing 250 cc. of this paste is placed in a water bath kept at 55° C., and when it has attained a constant temperature, 5 cc. of a five per cent. solution of the extract in distilled water is run in, and the whole mixed by shaking. At the end of half an hour the reaction is stopped by the addition of two or three cc. of a 10 per cent. solution of caustic soda, and the whole diluted to 500 cc. The sugar present is determined by Fehling's solution, and this, minus the quantity contained in the extract used, is the amount formed by diastatic action. If this should be greater than one-third the starch used, another experiment should be made with a smaller quantity of extract. The sugar should be calculated as maltose (reducing power = $\frac{2}{3}$ glucose), since this is the only sugar formed in the reaction.—Amer. Jour. Phar., Jan. 1886, 9-11.

Aqueous Extract of Adonis Vernalis—Preparation, etc.—Mr. Jehan Mordagne recommends that an infusion of the leaves and stalks be made by infusing in 6 parts of boiling water for 12 hours, decanting, pouring on 2 parts more of boiling water, infusing, straining, and evaporating the united infusion in a vacuum over a water bath. The yield as a mean of

three operations was 29%. Respecting the dose the author calculates, based upon Bubnoff's experiments, that the daily dose would be 1.10 gram, but remarks that this should be confirmed by clinical experience. The extract is brown by transparence, but black in bulk; there is nothing peculiar in the odor, but it is very bitter. It is entirely soluble in water. An

Hydro-alcoholic Extract of Adonis Vernalis is obtained by macerating the finely chipped drug in 6 parts of alcohol (60°) for ten days, decanting the liquid, distilling off the spirit and evaporating in a vacuum over a water bath to a syrupy consistence. At this point some tarry resinous products, which are insoluble in water, may be seen floating on the surface. The author has obtained good results by taking up the extract again with distilled water, filtering and evaporating to a homogeneous extract. The product differs principally from the aqueous extract in that it has an empyreumatic odor. The yield is practically the same as the aqueous extract. Subacetate of lead produces a more abundant precipitate, composed in part of aconitate of lead. Its reaction with phosphotungstate of sodium also differ somewhat from that produced with the aqueous extract.—Pharm. Jour. and Trans., Aug. 15, 1885, 146; Bull. de la Soc. de Pharm. du Sud-Ouest, July 1885.

Fluid Extract of Salix Nigra—Medicinal Use.—Dr. F. T. Paine recommends a fluid extract prepared from the inflorescence of *Salix nigra*, in drachm doses, for neuralgia and dysmenorrhœa of ovarian origin, and in the treatment of masturbation.—Amer. Jour. Pharm., Feb. 1886, 104; from Med. Age.

Extractum Pimentæ Foliorum—Experimental Results.—Mr. William Warner Abell states that, using alcohol to extract pimenta leaves, 7.5 per cent., of a dark-colored, oily extract was obtained; and with diluted alcohol, 12.5 per cent. The latter was of a pilular consistence, dark brown, and had the strong odor and taste of the drug.—Amer. Jour. Pharm., April 1886, 163.

Abstractum Pimentæ Foliorum—Preparation.—Mr. William Warner Abell has prepared an abstract of pimenta leaves by the pharmacopœial process for abstracts; it is of a light-green color and has a strong odor of pimenta.—Amer. Jour. Pharm., April 1886, 163.

Succus Eucalypti Globuli Laminæ—Properties.—According to Mr. Joseph Bosisto the freshly expressed juice of the lamina of the leaf of *E. globulus* is a tonic, antiperiodic and antiseptic. It contains the active principle in combination, and is employed in intermittent and remittent fevers, and in all affections of the respiratory organs. The tonic or bitter principle,

Eucalyptene, is employed in pill form, in doses of 2 to 3 grains.

The juice seems also to be employed in the inspissated form, in which form it is completely soluble in water.

Succus Eucalypti Rostrate is the inspissated juice of the red gum tree of Victoria. It possesses a delicate mucilaginous astringency, and is a safer remedy than either kino or catechu.—Phar. Jour. and Trans., March 20, 1889, 802-804.

EXTRACTA FLUIDA.

Fluid Extracts—Protest against Evaporation in their Manufacture.—Mr. W. Inglis Clark protests against evaporation of any portion of the percolate obtained in the preparation of fluid extracts. He maintains that the true object of extracting the active principles of a drug is to obtain these in a concentrated form without evaporation, and that this may be readily accomplished by observing certain precautions, and manipulating in a manner similar or identical with that pointed out by Dr. Squibb. The author communicates some experimental data in support of his view.—Pharm. Jour. and Trans., Dec. 19, 1885, 521-522.

Liquid Extract of Cinchona, B. P.—Unsatisfactory Character of Process.—Dr. B. H. Paul communicates the results of experiments to determine the degree to which the B. P. process for liquid extract of cinchona represents the bark from which it is prepared. He finds the process unsatisfactory, inasmuch as it fails to extract all the alkaloid. Thus a liquid extract made from bark containing 7.35% of total alkaloids, assayed by the B. P. test only 5%, and by a more accurate test this was reduced to 4.73%. Further experiments convince the author that one of the chief faults in the process lies in the insufficiency of the quantity of water used in the first maceration, and that if this quantity is increased the extraction will be materially hastened and correspondingly complete.

The water used preliminarily, together with the glycerin and hydrochloric acid, when properly employed to macerate the bark, will dissolve the whole of the alkaloid in the bark, and the more dilute this preliminary solution is the greater the liability of washing out all the alkaloid in the subsequent steps of the process.—Pharm. Jour. and Trans., Jan. 2, 1886, 561-562.

Extractum Cinchonæ Liquidum—Proposition of a New Menstruum.—Mr. H. H. Millhouse reviews the various papers and suggestions that have been made on the subject of this preparation of the British Pharmacopœia in a lengthy paper read at a meeting of the Chemists' Assistants Association (April 28, 1886). As a result of his numerous experiments, though not yet conclusive, he is inclined to recommend a mixture of glycerin and alcohol as a solvent for the bark, so mixed as to have a specific gravity equal to that of water, and to mix this with an equal volume of water.—Pharm. Jour. and Trans., May 15, 1886, 959-964.

Extractum Cinchonæ Liquidum—Determination of Alkaloidal Strength.

—Dr. J. E. deVrij employs the following method for the determination of the alkaloid percentage in liquid extract of cinchona: 10 grams of the extract are shaken with an excess of solution of soda and 200 grams of ether; the ether is decanted, and the residue shaken with 50 or 60 grams more of ether, which is decanted and added to the first. The ether solution is allowed to stand 12 hours, and, having become clear and colorless, is then carefully decanted into an evaporating vessel, and the ether evaporated, or distilled to dryness. The residue is dissolved in a little alcohol, transferred to a tared capsule, and evaporated and dried to constant weight. The weight so ascertained, multiplied by ten, gives the percentage of alkaloid in the extract.—Pharm. Rundschau, Nov. 1885, 252.

Liquid Extract of Cinchona, B. P.—Percentage of Total Alkaloid found in Commercial Specimens.—Mr. Wilfred F. Southall communicates some experiments to determine the value of the new process of the B. P. for the preparation of liquid extract of cinchona, and for ascertaining the total alkaloid contained in eight commercial specimens. The new process requires that the finished preparation be standardized so as to contain 5 parts of alkaloid in 100 fluid parts. Following the process of the B. P. accurately, the author obtained primarily twenty fluid ounces of aqueous liquid extract which, though prepared from a bark assaying 5.843 per cent. of total alkaloid, contained only 4.384 per cent. It consequently had to be standardized to 5 per cent by evaporation to 85 parts for every 5 parts of alkaloid found, addition of 12.5 parts of rectified spirit, and final adjustment to 100 fluid parts by addition of water. It will be noted that the amount of alkaloid abstracted by the process from the bark was 75 per cent of the total quantity contained in it, a result which is on an average with that observed by other experimenters.

The author found his own specimen of fluid extract to assay by the B. P. method 5.05 per cent. of total alkaloid. The eight commercial specimens assayed as follows: 3.98, 4.25, 6.33, 3.00, 5.22, 3.09, 3.44, and 2.12 per cent. respectively, duplicate assays of each specimen being made (the figures given being the highest noted by the author). The results show very conclusively that the B. P. process yields a product which will assay by the method given the percentage of alkaloid required. They show also that in the case of the preparations of commerce, as far as they have been examined by the author, there is something amiss.—Pharm. Jour. and Trans., March 13, 1886, 779-781.

Fluid Extract of Ipecac—Unsatisfactory Character of the Preparations of the U. S. P. of 1880.—Dr. A. B. Lyons, in connection with his very interesting paper on the "Assay of Ipecac" (see *Ipecac* under "Materia Medica"), criticises the process of the Pharmacopœia of 1880 for fluid extract of ipecac very unfavorably. He says that there is no difficulty in

preparing a fluid extract of ipecac with alcohol of moderate strength that will contain, by Dragendorff's mode of assay, upwards of 2 per cent. of emetine. By the U. S. P. process, a drug which assays 3 per cent. alkaloid will produce a fluid containing less than 1.5 per cent. From the first-mentioned extract, similar to that which was formerly official, it is easy enough to prepare a syrup, although certainly this cannot be done by simply mixing the fluid extract with syrup. He further remarks that to his own mind the admission of the present formula into the U. S. P. is an unwarranted concession to slipshod pharmacy, against which we should all unite in protest. However that may be, it seems desirable to verify or disprove the author's statements relative to so important a preparation, so that the fault, if any, may be suitably corrected.—See *Amer. Jour. Pharm.*, Nov. 1885, 538.

Fluid Extract of Ipecac—New Process.—Mr. R. Rother recommends the following process for the preparation of fluid extract of ipecac, which depends upon the ease with which alkaloidal emetine is dissolved by alcohol, so that by the peculiar manipulation directed the sixteen fluidounces of percolate obtained will accurately represent sixteen troy ounces of the drug:

Take of Ipecac, "pulverized"	16 troy ounces.
Magnesium oxide	1 troy ounce.
Alcohol sufficient to make	1 pint.

Mix the magnesia with two fluidounces of alcohol, and gradually mix with this the ipecac by means of a pestle. Now pack one-half of the moistened powder into a cylindrical percolator, and on the surface of the column place a double disc of filter paper exactly covering it. Upon this now pack the remaining powder more firmly than the first, and pour on alcohol until the liquid has slowly reached the base of the lower column. After a maceration of 12 hours pour on more alcohol, until 1 pint of percolate has slowly passed.—*Drugg. Circ.*, Jan. 1886, 4.

Fluid Extract of Cotton Root-Bark—Change caused by Deposits.—Mr. Charles C. Ramey reports several experiments made with this fluid extract, which had been filtered from the precipitate formed therein in about a year, and which in this condition had no effect when used by a physician in cases of menorrhagia. On the other hand, several doses of one grain pills, made from the dried precipitate, produced considerable nausea and effected a diminution of the flow in excessive menstruation. The menstruum used for the fluid extract is not stated.—*Amer. Jour. Pharm.*, March 1886, 119, from the author's thesis.

Fluid Extract of Corn Silk—Formula.—Mr. Spencer Phillips suggests the following formula for fluid extract of corn silk:

Dried Corn Silk	16 oz.
Diluted Alcohol	q. s.
Diluted Hydrochloric Acid	f $\frac{3}{4}$ j.
Glycerin	q. s.

Grind the corn silk in a mill as fine as possible. Having moistened the ground drug sufficiently, pack firmly in a glass percolator, then add enough menstruum to saturate and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and having covered the percolator, let it macerate *four days*. Then allow the percolation to proceed until the drug is exhausted. Having reserved the first thirteen fluid ounces, evaporate the remainder, having first added the diluted hydrochloric acid to this portion, by aid of a water bath, to the consistence of a soft extract. Dissolve this soft extract in glycerin and add sufficient glycerin to make the measure of one pint when added to the reserved liquid.—*Amer. Jour. Pharm.*, June 1886, 315.

Compound Fluid Extract of Buchu—Formula.—The following formula, which has been used by Dr. H. H. Stinson for ten years, with excellent results, is recommended: Buchu 16 troy ounces, uva ursi, cubeb and juniper berries, of each 4 troy ounces; prepare in the usual manner 28 fluid ounces of fluid extract, using 95 per cent. alcohol for the menstruum.—*Amer. Jour. Pharm.*, Feb. 1886, 98; from *N. E. Med. Monthly*, December 1885, p. 27.

Fluid Extract of Quebracho—A Remedy for the Relief of Asthma caused by Ipecac. Mr. Henry J. Wegener has repeatedly been relieved of asthma, caused by handling powdered ipecacuanha, by taking a dose of this fluid extract.—*Amer. Jour. Pharm.*, March 1886, 119.

Extractum Pimentæ Foliorum Fluidum—Proper Menstruum.—Experiments made by Mr. Wm. Warner Abell with alcohol, with alcohol (2 parts) and water (1 part), and with diluted alcohol, with and without the addition of glycerin, lead to the conclusion that diluted alcohol is the best menstruum, yielding a dark-colored, almost black fluid extract, having a strong, pungent taste of pimenta and fully representing the virtues of the leaves.—*Amer. Jour. Pharm.*, April 1886, 163.

GLYCERITA.

Glycerite of Opium—Formula and Preparation.—Mr. R. Rother having found glycerin to be advantageous as a solvent in connection with tincture of opium (which see under Tinctures) is led to recommend the following formula for preparing a glycerite of opium as likely to prove useful:

Opium, air-dried and in No. 24 powder	1 troy ounce.
Glycerin, }	of each sufficient to make 1 pint.
Water, }	

Mix one measure of glycerin and two measures of water, and add the opium to eight fluid ounces of this mixture; then, after a maceration of two days, with occasional shaking, pour it into a plain filter, and when the liquid has ceased to flow, follow with more of the menstruum until one pint of glycerite has been obtained. The author also recommends the preparation of a

Deodorized Glycerite of Opium, as follows: Mix 1 pint of glycerite of opium with 1 fluid ounce of petrolatum oil, and set the mixture aside in a moderately warm place. Shake it up frequently during an interval of 4 to 6 hours, and having wetted a filter with some of the glycerite, follow with the mixture until all the glycerite has been separated from the oil by passing through the filter.—Drugg. Circ., Mar. 1886, 53.

Glycerite of Alum—Formula, etc.—Dr. R. W. Parker recommends this as a powerful astringent, less disagreeable than tannin, and quite compatible with iron salts. It is prepared by dissolving with the aid of a gentle heat 1 part of alum in 5 parts of glycerin. The author also recommends

Glycerite of Subacetate of Lead, which is prepared as follows: Take of acetate of lead, 5 oz.; oxide of lead in powder, $3\frac{1}{2}$ oz.; glycerin, 1 pint (imperial); distilled water, 12 fluid ounces. Mix, boil for a quarter of an hour, filter and evaporate until the water is dissipated.—Amer. Jour. Pharm., June 1886, 296.

INFUSA ET DECOCTA.

Infusion of Senna—Cause of Spoiling.—Mr. Luettke, finding that the freshly prepared infusion of senna is invariably acid, concluded that this condition favored the setting up of fermentation and consequent rapid spoiling. Upon adding a little bicarbonate of sodium to freshly prepared infusions he found that their stability was greatly increased.—Pharm. Jour. and Trans., June 26, 1886, 1088; Der Pharmaceut, June 1, 1886, 83.

Infusion of Adonis Vernalis—Formula.—Mr. Jean Mordagne recommends that 2 grams of the dried leaves and stalks of *Adonis vernalis* be infused for 10 minutes in 100 grams of boiling distilled water. The infusion has a clear chestnut-brown color, and a yellow fluorescence; has at first a barely perceptible taste, but after a time, if in contact with the palate, a very disagreeable and especially persistent bitter becomes perceptible.—Pharm. Jour. and Trans., Aug. 15, 1885, 146; Bull. de Soc. de Pharm. du Sud-Ouest, July 1885.

Infusion of Loquat (Eriobotrya Japonica) is made in proportion of 1 part of the leaves to 8 parts of water and given in diarrhœa in doses of a tablespoonful every two hours. (See *Eriobotrya Japonica* under “Materia Medica.”)

Decoction of Sedum acre.—Use and value in the treatment of membranous group and diphtheria. (See *Sedum acre* under “Materia Medica.”)

LINIMENTA.

Ammonia Liniment—Unsatisfactory Character of the U. S. P. Formula, etc.—Mr. R. Rother observes that the Pharmacopœia now directs cotton-seed oil in the preparation of the liniment. But this oil is even less efficient for this purpose than the virgin olive oil. No saponification seems to occur, and the two liquids rapidly separate. A quantity of this liniment after long keeping and frequent shaking, disintegrates as obstinately now as when first mixed. There is a great difference between the so-called “virgin olive oil” and the common “sweet oil,” although the Pharmacopœia makes no such distinction. The “Malaga brand,” which is generally sold as common “sweet oil,” yields an excellent ammonia liniment. On mixing equal volumes of Malaga oil and cotton-seed oil, and using this mixture with a like measure of the 4f. ammonia water, a very excellent liniment results. There is now a liquid petroleum product in the market called by various fanciful names, but which for want of a better designation may be provisionally termed petrolatum oil. This oil resembles petrolatum in all respects excepting fluidity. Its specific gravity is lower than that of the usual fixed oils, as it floats on their surface and rapidly resumes this position when the strata are reversed. It does not unite with castor oil in permanent form, although the latter absorbs a portion of it. With olive and cotton-seed oils it readily and permanently merges in all proportions. A mixture composed of equal volumes of cotton-seed oil and petrolatum oil added to an equal volume of 4f. ammonia water, yields a very fine ammonia liniment, which is certainly superior to all others of the kind.—*Drugg. Circ.*, Jan. 1886, 5.

Turpentine Liniments—Effecting Clear Mixtures.—Mr. W. H. Wearn observes that when one or two drachms of camphor is dissolved in one ounce of oil of turpentine, the oil will dissolve in 95% alcohol, or tincture made of the same in all proportions. It will also readily mix with a strong spirit of ammonia made by mixing 1 part of stronger ammonia water and 2 parts of alcohol.—*West. Drugg.*, Jan. 1886, 9.

Linimentum Terebinthinæ, B. P.—Insufficiency of the Quantity of Water directed in the Official Formula.—Mr. W. Baxter, Jr., referring to the numerous criticisms of the formula of the B. P. for the above liniment, records a number of experiments made by him to determine the cause of the trouble so generally experienced. He finds that the trouble lies in the insufficiency of the quantity of water directed, which quantity should be *just doubled*. Any less than twice the quantity of water ordered in the B. P. will cause the formation of a gelatinous liniment, which in every case tried by the author could readily be converted into a homogenous white emulsion upon adding the necessary quantity of water equal to doubling the official and shaking a few seconds.—*Phar. Jour. and Trans.*, June 5, 1886, 1026.

Hypnone Liniment—Formula and Uses.—Mr. Pierre Vigier recommends a liniment which consists of equal quantities of hypnone and expressed oil of almond. This is superior to liniments containing chloroform, which evaporates so readily, while hypnone remains in contact with the skin for a much longer time, its boiling point being 199° C.—*Amer. Jour. Pharm.*, June 1886, 295; from *Gaz. Hebd.*, Jan. 22, 1886.

Spiritus Saponatus—Preparation.—According to Mr. Peterson, spiritus saponatus, *Phar. Ger.*, can readily be prepared by mixing the oil, caustic potash and a fourth part of the alcohol, in a glass-stoppered bottle, and shaking every 3 or 4 hours. In two or three days the oil is saponified and can then be diluted with the water and remainder of the alcohol. By this method no heat is required nor is there any loss in alcohol.—*Amer. Jour. Pharm.*, Jan 1886, 16; from *Schweiz. Wochenschrift*, 23, p. 362.

Carbolic Oil—Definite Preparation.—Mr. R. Rother considers it desirable that a popular compound termed carbolic oil should conform to a definite standard. It could properly be prepared by fusing half a troy ounce of crystallized carbolic acid with a gentle heat and mixing it with cotton-seed oil to the measure of one pint. By employing cotton-seed oil and petrolatum oil in equal volumes, with the phenol as before, a superior product results.—*Drugg. Circ.*, Jan. 1886, 5.

Olea Cocta.—Modified Process.—Mr. Eugen Dietrich recommends an improvement on the officinal process of the *Pharm. Germ.*, which consists in employing the herb in powder and extracting it with the oil divided into two portions, whereby he obtains a deeper color and in every way a more satisfactory product. The process as applied to

Oleum Hyoscyami, for instance, is as follows:

Hyoscyamus, powdered.	100 parts.
Alcohol	75 "
Olive Oil	1,000 "

Mix the hyoscyamus with the alcohol, introduce the damp mixture into a stone vessel of suitable capacity, close it, and set aside for twenty-four hours. Then add 600 parts of olive oil, digest, under frequent agitation during ten to twelve hours, at a temperature of 60° — 70° C. (140° — 158° F.), and express strongly. To the residue add 400 parts of olive oil, digest in the same manner, express, and add to the first portion.

The yield amounts to about 920 parts.—*Amer. Drugg.*, June 1886, 107.

Apone.—A New Remedy for Rheumatism, etc.—Dr. V. Poulet recommends the following preparation, which he has named "apone," as a remedy for rheumatism, neuralgia, etc. It is made by macerating for one month capsicum 200 in alcohol 1,000 and ammonia water 100, and adding to the expressed liquid chloral 10 and oil of thyme 10. For external use it may be diluted with oil; for internal use from 5 to 20 drops

are taken with a little water, to be followed by a glassful of cold water or cold tea.—Bull. Gén. Thérap., Feb. 13, 1886.

LIQUORES.

Liquor Morphine Bimeconatis—*Caution as to Quality of Filter Paper.*—Mr. Thomas Green observes that whilst the solution of bimeconate of morphine, as originally introduced by Mr. Squire, was of a cherry-brown color, that obtained by the process of the new British Pharmacopœia is colorless. If, however, a filtering paper containing a trace of iron is used, the solution becomes more or less colored. Filter paper entirely free from iron must therefore be used in case it becomes necessary to resort to filtration. Any traces of iron are best removed from the paper by washing it with dilute nitro-hydrochloric acid, and then rinsing thoroughly with distilled water.

Liquor Calcis—*Percentage of Calcium Hydrate in Commercial Specimens.*—Mr. M. Jay has examined ten commercial samples of lime water, procured from different druggists. 50 cc. of each were titrated with decinormal hydrochloric acid, and the following percentages of calcium hydrate were found :

No. 1	0.103 per cent.
No. 2	0.142 "
No. 3	0.142 "
No. 4	0.145 "
No. 5	0.150 "
No. 6	0.155 "
No. 7	0.160 "
No. 8	0.161 "
No. 9	0.165 "
No. 10	0.171 "

The mean value is 0.149 per cent.—Amer. Jour. Phar., June 1886, 284.

Solution of Calcium Super-Phosphate—*Formula.*—Mr. R. Rother recommends the following formula :

Calcium carbonate	30 grains.
Phosphoric acid	4 drams.
Water sufficient to make	2 fl. ozs.

Mix the phosphoric acid with water to the measure of 2 fluid ounces ; then gradually add the calcium carbonate, and filter the solution if desirable. The author also recommends the following formulas for ferric and compound solutions of super-phosphates :

Solution of Ferric Super-Phosphate :

Take of Citrate of Iron	48 grains.
Phosphoric acid.	4 drams.
Water sufficient to make	2 fl. ozs.

Mix the phosphoric acid with water to the measure of one fluid ounce. Dissolve the citrate of iron in one fluid ounce of water, with the aid of heat, and add water to the solution till it measures one fluid ounce. Pour the iron solution into the phosphoric acid mixture, and filter if desirable.

Compound Solution of Superphosphates.—Take of

Citrate of iron	8 grains.
Calcium carbonate	18 "
Potassium bicarbonate	9 "
Sodium phosphate.	8 "
Phosphoric acid	4 drams.
Water, sufficient to make	2 fl. ozs.

Mix the phosphoric acid with water to the measure of one and a half fluid ounces; then gradually add the calcium carbonate, followed by the potassium bicarbonate and sodium phosphate, and occasionally agitate the mixture until solution has resulted. Dissolve the ferric citrate in half a fluid ounce of water with the aid of heat, and pour the solution when cooled into the first solution; then add water to the measure of two fluid ounces and filter after several days if desirable.—*Drugg. Circ.*, May 1886, 100.

Liquor Plumbi Subacetatis—*Volumetric Method of Assay.*—Messrs. W. H. Clubb and J. W. Lang, in search for a convenient and accurate method for the assay of liquor plumbi subacetatis, found the following method to give the most satisfactory results: A weighed quantity of the liquor is diluted with distilled water containing a little acid; to this a measured quantity of normal oxalic acid is added in excess, and ammonia to render the solution slightly alkaline; the liquor is then filtered, and the precipitate washed with distilled water until all the oxalate of ammonium is removed. The filtrate and washings are mixed, acidified with sulphuric acid, and titrated for the excess of oxalic acid with solution of permanganate. The data thus obtained enable the ready calculation of the percentage of subacetate of lead in the solution.—*Pharm. Jour. and Trans.*, Jan. 30, 1886, 656, 657.

Liquor Aluminiumi Acetici—*Simple Method of Preparation.*—Dr. G. Vulpius recommends the preparation of the solution of acetate of aluminium from the soluble subacetate of aluminium (now found in the market) as follows: 150 parts of subacetate of aluminium are mixed with 810 parts of water and 40 parts of diluted acetic acid (*Pharm. Germ.*); the mixture is stirred frequently until solution is effected, then allowed to rest in a cool place for several days, when the clear solution is decanted. It must be preserved at a temperature not exceeding 20° C.—*Arch. d. Pharm.*, May (2) 1885, 444-448.

Solution of Citrate of Magnesium—*Examination of Commercial Samples.*—Mr. C. B. Stevens finds that a bottle of solution of citrate of magnesia, when properly prepared, should contain about 82 grains of oxide

of magnesium as determined by the several methods of analysis. He examined five commercial samples and found four of them to contain respectively: 27 grains ($=34\%$), 67 grains ($=81\%$), 73 grains ($=89\%$), and 62 grains ($=75\%$ of the required amount). The fifth sample contained tartrate of sodium and potassium, and not even a trace of magnesia. The author recommends the following modified formula for solution of citrate of magnesium: Dissolve 410 grains of citric acid in 8 ounces of water, and add 90 grains of calcined magnesia (Jenning's); add 960 grains of sugar, with which 2 drops of oil of lemon have been previously rubbed; add water to make 12 ounces, and filter. Finish in the usual way, adding 30 grains of bicarbonate of potassium before corking. The product is superior to that of the U. S. P.—Proc. Mich. State Pharm. Assoc., 1885, 143-145.

Salicylic Lemonade—Formula—The following beverage was found useful by a British medical officer of the Soudan expedition in typhoid, scurvy, gout, and other fevers:

Squeeze the juice from ten lemons, and set it aside. Boil the fruit in half to three-fourths of a gallon of water for fifteen to twenty minutes. After standing six hours, take out the lemons, again press them, and throw the exhausted skins away. Add the juice and one-half ounce of citric acid to the liquid, boil for five minutes, and strain. While still hot add to it two hundred grains of salicylic acid, and stir until dissolved. Sweeten to taste with white sugar, and add enough water to make, of the whole, one gallon.

Unless preserved by the aid of a little brandy, the salicylic lemonade should be made fresh after two or three days.

To "brighten" its appearance, add, when cold, a little beaten white of egg, boil for three minutes, and filter.

Half an ounce of gelatin dissolved in the hot liquid before straining (previously soaked for five hours in cold water) will render the lemonade less harsh.—Amer. Drugg., Nov. 1885, 218; from Br. and Col. Druggist.

Sulphuric Acid, Lemonade—Uses and Preparation.—See *Sulphuric Acid* under "Inorganic Chemistry."

Liquor Bismuthi et Ammonii Citratis—Satisfactory Formula.—Mr. Peter MacEwan draws attention to the unsatisfactory character of the formula of the B. P. for solution of ammonio citrate of bismuth, inasmuch as the citrate is not completely dissolved. He recommends the process published a number of years ago by Mr. Méhu (see Proceedings 1874, 1884), as giving perfectly satisfactory results; but inasmuch as Mr. Méhu's paper does not contain other than approximate quantities, Mr. MacEwan gives the following formula for a pint of the liquor: Heat 1 ounce and 180 grains of subnitrate of bismuth with $1\frac{1}{2}$ fluid ounce of nitric acid until the

salt has dissolved and the solution has acquired the appearance of a syrup; with this mix 1 ounce and 60 grains of citric acid, previously diluted in an ounce of water by the aid of heat; divide the solution into two equal portions, and to one portion add solution of ammonia until the precipitate at first formed is re-dissolved; dilute with water to 1 pint, add the remaining portion of the bismuth solution with constant stirring, collect the precipitate on a calico filter, and wash with water until the washings are free from acid. Transfer the precipitate to a suitable vessel, and add solution of ammonia gradually and with constant stirring, until the precipitate is just dissolved. Dilute with water to 1 pint. The loss in citrate by this process, as determined by the author, is under 3 per cent. —Pharm Jour. and Trans., Jan. 16, 1886, 602-603.

Decolorized Solution of Iodine—Proposed Preparation by the Aid of Resorcin.—Mr. H. N. Draper, after reference to the inutility of the combination of iodine with carbolic acid, sodium acetate or hyposulphite, and the iodate and iodide of ammonium, speaks of the observation of Hlasiwetz that resorcin, in common with orcin and phloroglucin forms loose combinations with iodine, and says that he was thereby led to attempt a solution of iodine which should possess its therapeutic value without coloration. He says, when an iodine solution is added to an excess of a solution of resorcin, the former is at once decolorized. Nor does this solution give the starch reaction of iodine. The preparation of a decolorized solution of iodine, by means of resorcin, may be effected in several ways. The iodine may be, for example, dissolved in anhydrous ether, and gradually added to the warm solution, or chloroform or carbon bisulphide may be used in the cold, and the resorcin solution will gradually, upon agitation, withdraw the iodine from these solvents. The quantity of iodine which can be in this way decolorized depends, not only upon the proportionate quantity of resorcin employed, but upon the quantity of water involved. It is remarkable that a solution containing a small proportion of resorcin may be scarcely perceptibly darker in color than one which contains a much larger quantity of the organic body; and although in the first case, perhaps, the whole quantity of free iodine in the solution does not exceed 0.01 grain, yet this is not absorbed by the additional resorcin. But we are dealing here with a very exceptional set of conditions, and have a remarkable example of what Hlasiwetz strikingly describes as the middle ground between solution and chemical combination. There is, indeed, constantly apparent a struggle, so to speak, between the involved molecules; and this is influenced, not only by the relative quantity of the organic body present, but largely by that of the water. If, for example, a solution of iodine and resorcin be taken which colors starch distinctly, and gives up iodine to chloroform, and to this solution be added its own volume of water, the starch coloration is much less marked, and that of chloroform but faintly perceptible.

If now another volume of water be added, the starch paste is not colored at all, and chloroform remains colorless. An iodine solution which shall not stain the skin has been a desideratum. Here it is, and it is what it claims to be; that is, that the greater part of its iodine is in so unstable combination that upon spontaneous evaporation it is left as free iodine; while, on the other hand, until the solvent has evaporated, the iodine remains upon the skin tissue easily assimilable.—*Amer. Drugg.*, Dec., 1885, 223; from *Brit. and Col. Drugg.*

Solution of Ferrous Iodide—Permanent Preparation.—Mr. A. E. Robinson, as the result of extensive experiments, which are given in some detail, recommends the following formula for preparing a permanent solution of ferrous iodide:

Iodine	1,804 grains.
Iron wire	2 oz.
Distilled water	6 fl. oz.
Hypophosphorous acid (containing 20 per cent. of H_2HPO_2)	3 fl. drachms.

Digest the iodine, iron wire, and water at a gentle heat until combination is complete, filter into the hypophosphorous acid, and add sufficient distilled water to make 8 fl. oz.

This will contain in each drachm 34.4 grains of ferrous iodide, FeI_2 , and, when added to simple syrup in the proportion of 1 part to 7 parts by measure, will form *syrupus ferri iodidi*, P. B.—*Yearbook of Phar.*, 1885, 484-491.

Liq. Ferro "Pagliari"—*Character and Composition.*—Dr. L. Vinni states that the "Ferro Pagliari" so largely used at present in Italy, is physically, a limpid, transparent liquid, of clear, greenish color, inodorous, styptic, and acid in reaction and taste, even when largely diluted. The solution has a specific gravity of 1.050 (Skoda), and mixes with watery and dilute alcoholic liquids unchanged. If a dilute solution be treated with tannin or potassium ferridcyanide, the presence of a ferrous salt is quickly evinced, and on the addition of silver nitrate, a voluminous precipitate of chloride is formed. Preserved in enclosed vessels and exposed to the light, it remains unchanged. It has been recently introduced extensively by Pagliari, of Florence, already noted for the well-known haemostatic liquid which bears his name, *Aqua Pagliari*. He claims that it represents the very best form of iron administrable, and advises its use in doses of 10 drops or 14 to 20 drops a day, *i. e.*, half at breakfast and the other half at dinner, largely diluted with water.

Mr. Jos. W. England states that this preparation, without question, is analogous to the "*Liquor Ferri Chlorati (s. muriatici oxydulati)*" of the former German Pharmacopœia, which is made by adding 520 parts of hydrochloric acid to 110 parts of iron-wire, allowing chemical reaction to ensue; heating, however, toward the end, to facilitate the emission of

hydrogen. Then rapidly filter, and to the filtrate, after the addition of 1 part hydrochloric acid, add sufficient distilled water to make the finished product weigh 1,000 parts.—*L'Orosi*, Sept. 1885.

Acid Solution of Pyrophosphate of Iron—Formula.—Mr. R. Rother recommends the preparation of a solution of pyrophosphate of iron as follows:

Pyrophosphate of iron	2 drams.
Potassium citrate	2 “
Phosphoric acid, officinal	193 grains.
Water, sufficient to make	1 fluid ounce.

Mix the phosphoric acid with enough water to bring the liquid to the measure of a fluid ounce and add the potassium citrate. Stir the mixture well together, add the pyrophosphate of iron and apply heat until most of the latter has dissolved; decant the solution, add a little water to the residue, and when this has been dissolved as before, unite the solution with the decanted portion, together with enough water to make the liquid measure one fluid ounce, and filter if desirable. The acid solution so obtained serves a useful purpose in many cases. A

Simple Solution of Pyrophosphate of Iron, which is permanent and may be used extemporaneously for different purposes, is made as follows:

Pyrophosphate of iron	2 drams.
Glycerin	2 fluid drams.
Water, sufficient to make	1 fluid ounce.

Dissolve the pyrophosphate of iron in five fluid drams of water by the application of heat, filter the solution when cooling, adding water through the filter to the measure of five fluid drams, and mix it with the glycerin.—*Drugg. Circ.*, April 1886, 99.

Heger's Fluid—Formula.—This fluid was recommended by the late Dr. R. C. Brandeis to be inhaled in the proportion of a few drops every hour, for the relief of catarrhal headache, and causes a profuse secretion of mucus, followed by relief from the pain. The formula for its preparation is as follows:

R. Carbolic Acid (cryst.)	ʒj.
Alcohol (strong)	ʒij.
Strong Water of Ammonia	ʒj.
Distilled Water	ʒij. M.

—*Amer. Drugg.*, Dec. 1885, 224.

Fehling's Solution.—Action of Light.—Dr. Eder finds that the decomposability of Fehling's solution falls considerably with the degree of dilution. A concentrated solution, or one diluted with an equal volume of water, separated about thirty-five times more cuprous oxide in fourteen weeks than one kept in the dark. Very dilute solutions were stable in the dark, but underwent perceptible decomposition under the influence

of light.—Pharm. Jour. and Trans., Oct. 3, 1885, 285; from Monatshefte, vi. 495.

Fehling's Solution.—*New Method of Preparation.*—Prof. Schmiedeburg uses mannite in place of Rochelle salt in making Fehling's solution. He claims that the addition of mannite insures stability to the solution. His formula is as follows: Dissolve 34.632 grams of crystallized copper sulphate in 200 cc. of water; to this solution is added a solution of 15 grams of very pure mannite in 100 cc. of water and 480 cc. of solution of caustic soda (1.145), and, lastly, sufficient water to make 1 liter.—Amer. Jour. Pharm., June 1886, 16; from Schweiz. Wochenschrift, xxiii, p. 400.

Nessler's Solution.—*Inaccuracy of the Formula of the B. P.*—Mr. Thomas Green calls attention to the fact that the formula in the B. P. is faulty in that it prescribes an insufficient quantity of iodide of potassium, the correct quantity being just double that given. Corrected thus, it should be 270 grains of iodide of potassium, 100 grains mercuric chloride, and 15 ounces of distilled water.—Pharm. Jour. and Trans., May 1, 1886, 922.

Liquor Thioticus s. Sulphuratis.—A substitute for ammonium sulphide and sulphydric acid. Under this name Dr. Hager uses a solution of 0.2 washed sulphur in 5 cc. of carbon bisulphide, to which 5 cc. benzol and 10 cc. of ether are added, as a substitute for sulphide of ammonium or sulphydric acid. The benzol and ether are added to make the liquid lighter than water. He proceeds as follows: A small quantity of solution of caustic soda is added to some of the test liquid; the substance to be examined is then added and the mixture heated to boiling, agitating constantly. To test for arsenic, antimony and tin, muriatic acid is added after the evaporation of the ether. Liquor thioticus is readily prepared, and free from the disagreeable odor of sulphuretted hydrogen.—Amer. Jour. Pharm., Nov. 1885, 552; from Rundschau.

MIXTURES.

Emulsions—Preparation.—Mr. O. Linde, after drawing attention to the different methods that have been proposed and are in use for emulsionizing oils, gives the following as the one which in his opinion gives the best results. 3 parts of mucilage of gum arabic (prepared in the proportion of 1 p. gum to 3 p. water) are placed in an emulsionizing mortar and 2 parts of the oil are added, in small portions at a time, with continuous trituration. The process is liable not to succeed if the whole of the oil is added at once, or if the whole of the oil is first placed in the mortar, and the mucilage is added gradually. The method is equally applicable for fixed and volatile oils. A well prepared emulsion is not influenced either by heat, or by solutions of saline substances, either cold or hot.—Arch. d. Pharm. Nov. (2), 1885, 888-893.

Emulsion of Cod Liver Oil—Formula.—The following is said to be a good formula: Olei morrhuae, 62; acaciæ pulv., tragacanthæ pulv., marantæ, aa 1; syrupi, 10; aq. destil., 55. Mix the powders in a mortar and add the oil; pour into a bottle, add 31 of water, and shake for ten minutes. When the oil is emulsified the syrup and balance of the water are added.—Amer. Jour. Pharm., Nov. 1885, 551; from Schweiz. Wochenschrift.

Emulsion of Copaiba—Formula.—Mr. Van de Walle emulsionizes copaiba balsam according to the following recipe:—Balsam of copaiba 50; white sugar, 25; honey 25; distilled water, 5; essence of mint, 0.5; carmine (to color), q. s. The balsam, sugar, honey, and water, are mixed together in a basin, and slightly heated for ten minutes with constant stirring. The essence and color are added when the mixture is completely cold. The preparation forms a red gelatinous product, almost entirely devoid of the odor of copaiba.—Amer. Drug., Nov. 1885, 216.

Paraldehyde Mixture—Formula.—Dr. R. G. Eccles, after giving a definite description of paraldehyde, tests of purity and identity, etc., reviews the methods for its administration that have been proposed, and recommends the following as having so far given the best results: Take of paraldehyde, ol. amygdal. dulc., aa 3ij, chloroform, gtt. xij., ol. cinnam., gtt. iij. Mix the ingredients in a perfectly dry vial. The dose for an adult is one-half the contents of the vial. The author concludes his paper by a historical sketch of the substance, the method of its preparation and its chemical constitution.—Proc. N. Y. State Pharm. Assoc., 1886, 160-166.

Hypnone Mixture—Formula, etc.—The preparation of a syrup and of an elixir containing a medicinal dose of this new remedy, necessitates the use of a large and objectionable quantity of alcohol. Mr. Pierre Vigier recommends for this reason the administration in the form of an emulsion, as follows: Take of hypnone, 20 drops; expressed oil of almond, 10 gm.; gum arabic, 10 gm.; syrup of orange flowers, 60 gm.; water, 120 gm. Of this emulsion one-fourth, one-third, or even one-half is taken at a dose, representing respectively five, seven or ten drops of hypnone. The mixture keeps well and has a pleasant taste.—Amer. Jour. Pharm., June 1886, 295; from Gaz. Hebd., Jan. 22, 1886.

Salicylic Acid and Iron Mixture—Formula.—Dr. John C. Martin communicates the following formula for a mixture of salicylic acid and iron, which has been in use in the New York Hospital, and has proven to be an excellent combination: Take of salicylic acid, gr. 20; pyrophosphate of iron, gr. 5; phosphate of sodium, gr. 50; water, sufficient to make 1½ ounces. Filter, if necessary. The preparation keeps indefinitely. Glycerin or syrup may be substituted for a portion of the water to improve the taste.—Pharm. Rec., April 15, 1886, 115.

Manna Mixture—Formula.—Mr. Joseph Ince speaks highly of this mixture, which is prepared as follows:

Infus. Rhei	4 ounces.
Tinct. sennæ	6 drachms.
Mannæ	1 ounce.
Aq. Cinnam.	ad. 6 ounces.
M. Ft. Mist. Sumat quartam partem o. n. h. s.	

The following was Dr. Abernethy's favorite aperient mixture:

Mag. sulph.	½ ounce.
Inf. sennæ co.	6 drachms.
Aq. menth. vir.	1 ounce.
Mannæ	2 drachms.
Tinct. sennæ	2 drachms.
Aq. puræ	2 ounces.
M. Capiat coch. ij. mag. mane.	

—Amer. Drugg., Nov. 1885, 218.

Chlorodyne—Modified Formula.—Mr. R. Rother recommends the following formula for preparing chlorodyne:

Morphium sulphate	16 grains.
Diluted hydrocyanic acid	40 drops.
Tincture of capsicum.	1 fluidrachm.
Oil of peppermint	2 drops
Chloroform	4 fluidrachms.
Glycerin	4 "
Alcohol to make.	2 fluidozs.

Mix.

—Drugg. Cir., Mar. 1886, 53.

Dunlap's Diarrhœa Mixture—Formula.—The following, from "New Eng. Med. Monthly," is given in Amer. Jour. Pharm. (Aug. 1885, 372):

R. Tincture of opium,	
Tincture of camphor,	
Tincture of peppermint	aa 3 ss.
Tincture of ginger	3 iij.
Tincture of capsicum,	
Hoffman's anodyne	aa 3 ss.

M. Dose.—A teaspoonful diluted with sweetened water, after each operation. This is especially good in cholera morbus.

Whooping-Cough Mixture—Formula.—Dr. A. Platt has found the following mixture to answer an excellent purpose:

R. Copaibæ,	
Balsam. tolut,	
Pulv. acaciæ	aa 3 ss.
Aquæ	3 iv.
Acid. sulphuric. aromat	gutt. xx.

Mix the acacia with the balsams and gradually add the acidulated water.

Dose.—A teaspoonful when required, three, four, or five times a day.

—Amer. Jour. Phar., Aug. 1885, 384, from N. E. Med. Monthly.

PILULÆ.

Pills and Excipients.—Mr. Thomas S. Wiegand read an interesting and practical paper on pills and excipients at a recent pharmaceutical meeting of the Philadelphia College of Pharmacy. The paper will be referred to with advantage in Amer. Jour. Phar., December 1885, 593-596.

Pill Excipients.—Mr. J. B. Morris has contributed an interesting essay on pill excipients for which the prize was awarded in the Assistants' competition in connection with the Edinburgh Chemists' Assistants and Apprentices' Association. Reference may be had to the author's paper in Pharm. Jour. and Trans., August 8, 1885, 126-127.

Martindale's Mass.—A paraffin excipient for deoxidizable substances. (See *Paraffin*, under Organic Chemistry.)

Pill Masses—Excipients.—Mr. D. Zewalthoff makes some practical observations on pill masses. He observes that the pill mass must have the consistency of a thick, well-mixed dough, which shall be easily removed from the side of the mortar and spatula, and must not stick to the fingers while being kneaded. In cases where the ingredients prescribed by the physician cannot be brought to a mass having the above qualities, the privilege is given the pharmacist to add such constituents as will cause the mass to adhere properly. Working under such a "law," a great deal depends upon the experience of the pharmacist, who must select from innocent powders when the material is too soft, or from substances partaking of the nature of extracts when the ingredients are dry. The author mentions a series of excipients and the cases in which they are particularly applicable.—Phar. Rec., Oct. 1, 1885, 323.

Pills Containing Essential Oils—Excipients, etc.—Mr. C. Jonas considers that for pills containing a large quantity of essential oil, tragacanth is not the best excipient. It leaves much of the oil on the pestle, mortar, and pill-machine, and the pills thus made soon become very hard. He prefers carbonate of magnesium and balsam of Peru. For such a prescription as the following, for instance: Essential oil of rue, 30 drops, to make 30 pills—the process would be to put the oil in the mortar, add carbonate of magnesia q. s. to make a half dry mass, and make up with 8 to 10 drops of balsam of Peru. This mass is perfectly homogeneous and easily divided. The pills remain plastic for a long time. For croton oil and creosote he uses carbonate of magnesia only.—Amer. Drugg., Sept. 1885, 172; from L'Union Pharm., 1885.

Quinine Pills—Addition of Tartaric Acid.—Mr. Clay W. Holmes advises the addition of about 5 per cent. of tartaric acid to the quinine when making pills, such retaining their solubility for a long time unimpaired. As excipient he uses 60 grains of gum arabic per ounce of quinine sulphate and sufficient syrup to make a mass.—Proc. N. Y. State Pharm. Assoc., 1886, 172, 173.

Quinine Pills—Solubility.—Mr. J. W. Pancoast made experiments to determine the conditions favoring the solution of quinine pills. Immersed in water at ordinary temperature for two days and without being agitated, compressed pills and sugar-coated pills seem to be little altered; uncoated pills (formula and hardness not indicated) separated into a few fragments without dissolving, and gelatin-coated pills became very soft. But when the pills were digested, with occasional agitation, in warm water or in acidulated water, or in a liquid imitating saliva, they were all dissolved, the time varying between thirty minutes and a few hours.—*Amer. Jour. Pharm.*, Feb. 1886, 86; from the author's thesis.

Blaud's Pills—Improved Formula.—The following formula is recommended by Mr. Martindale as superior to that usually employed:

R. Ferri sulphatis	gr. iiss.
Potassæ carb.	gr. iss.
Pulv. sacchar	gr. j.
Pulv. g. tragacanth	g. ⅙.
M. Ft. pil. j.	

—*Pharm. Jour. and Trans.*, Aug. 8, 1885, 127.

Permanganate of Potassium Pills—Excipient.—Mr. Wm. M. Lewis regards pipe-clay as the most suitable excipient, but Mr. Sam. F. Stroll, who has experimented in the same direction, believes cacao butter to be superior to all other excipients, which have been recommended for this salt. In preparing the pills a warm mortar is used in which the salt is powdered, and, for every two grains of it, incorporated with one-half a grain of cacao butter. The pills are very small.—*Amer. Jour. Pharm.*, Feb. 1886, 86; from the author's thesis.

Pills of Permanganate Potassium—Formulas.—The experiments of Mr. E. G. Patch lead him to recommend one of the following formulas for making pills of permanganate of potassium:

“*First.* Resin cerate, in proportion varied according to the size of the mass, from 15 to 20% of the finely powdered permanganate used. Five grains will make a mass with 25 grains of the salt; 15 grains will make a mass with 100 grains of the salt.

“*Second.* One part of permanganate, $1\frac{1}{2}$ parts of kaolin (the clay used for making white porcelain), and water, q. s. The amount of water will vary from $\frac{1}{2}$ to $\frac{3}{4}$ of a part.

“*Third.* Permanganate, 2 parts; kaolin, 1 part; and petrolatum, q. s. The amount of petrolatum required depends upon its consistence. He finds that 4 grains, with 24 grains of permanganate and 12 grains of kaolin, makes a mass somewhat more plastic than No. 1, and decidedly more so than No. 2.

No. 2 disintegrates most rapidly in contact with water, and No. 1 the least rapidly.”—*The Pharmacist*, 1885.

Pills of Sulphide of Zinc—Formula.—Mr. Pierre Vigier suggests the following formula for pills of hydrated sulphide of zinc (see under “Inorganic Chemistry”): Zinc sulphide 1.0 gm., liquorice root and syrup of acacia, q. s.; to be made into 100 pills, of which from five to ten are to be taken daily.—*Amer. Jour. Pharm.*, June 1886, 294; from *Gaz. Hebdom. Méd. Chir.*, Feb. 5, 1886.

Pills of Terpinol—Tanret's Formula.—Prof. Dujardin-Beaumetz, in connection with his remarks on *terpin* and *terpinol* (which see under “Organic Chemistry”) gives the following formula for pills of terpinol, the same being suggested by Mr. Tanret:—Take of terpinol, benzoate of sodium, of each, ten centigrams (one and two-thirds grains), sugar, q. s., for one pill.—*Amer. Jour. Pharm.*, March 1886, 144.

Hæmstatic Pills—Huchard's Formula.—The following formula is given in “*L'Union Méd.*”: Ergotin and quinine sulphate, of each 2.0 gm.; pulverized digitalis and extract hyoscyamus, of each 0.2 gm. Make 20 pills, of which from five to ten are given during a day.—*Amer. Jour. Phar.*, June 1886, 295.

Glycerin Capsules—Preparation.—In the treatment of trichinosis, according to the experience of Dr. Fiedler, glycerin has been found the only remedy which can be used at the present time with some expectation of success, and it appears to be desirable to find some method by which the glycerin may be made to pass as little diluted as possible into the small intestines. Mr. Julius Mulfinger has now experimented with a view to solving this problem. Proceeding from the idea that the usual size of pills does not admit the inclosure of a sufficiently large quantity of glycerin, he experimented with Limousin's wafers, coating them internally with 2, 3, or more layers of a resin solution containing 4 grams resin, 1 drop oil of cinnamon, 10 drops olein, and 16 grams ether. Care must be observed that the coating on the inner surface and edges of the wafers is sufficiently thick. A glycerin paste, composed of tragacanth 1 p. and glycerin 25 p. is formed into globular portions, placed on the centre of one of the wafers, the edge is freshly coated with resin solution, the cover wafer—which must be coated like the under one—is pressed on gently, and the capsule thus formed is allowed to dry.—*Pharm. Centralb.*, 1885, No 25.

PULVERES.

Granulated Citrate of Magnesium—Contamination with Tartaric Acid.—Mr. A. H. Cohn has examined three specimens of granulated citrate of magnesia of different manufacturers, and found all to be contaminated, more or less, with tartaric acid. Quantitative tests gave the following results:

No. 1	contained	9.77	per cent.	of tartaric acid.
“ 2	“	19.42	“	“ “ “
“ 3	“	31.5	“	“ “ “

A test was also made for sulphuric acid, and the three samples gave the precipitate with barium chloride.

The amount of sulphuric acid was estimated in numbers "one" and "two," with the following result:

No. 1	contained	7.07	per cent.	of sulphuric acid.
" 2	"	.699	"	"
" 3	"	a small trace.		

—Amer. Jour. Pharm., May 1886, 235-236.

Granular Effervescent Superphosphate—Preparation.—Mr. R. Rother observes that it would seem as though a saccharine granular form of compound superphosphates would be preferable to a liquid form. Such a combination could doubtless be effected by mixing a granulation of the carbonate and neutral salts with another granulation of acid sodium phosphate. The acid sodium phosphate granulation could be readily made by mixing 358 parts of ordinary sodium phosphate with 196 parts of phosphoric acid, and converting this solution into a granulation by the addition of sugar in the usual manner.—Drugg. Circ., May 1886, 100.

Hydrargyrum cum Creta—Improved Process of Preparation.—Mr. Robert B. Matter suggests the following process, which in his hands has been uniformly successful, and by which 4 or 8 oz. of the preparation can be made within one hour.

Mix 12 parts of finely powdered gum arabic with 12 parts of prepared chalk, triturate it with water sufficient to form a rather thin paste, add 38 parts of mercury, and continue the trituration until the globules of mercury have disappeared. Now add 38 parts of finely powdered prepared chalk and sufficient water to form a thin paste, triturate, and when all the globules of mercury have disappeared, place the mortar in a hot water-bath. The mixture distributed around the sides of the mortar will dry rapidly, when it can be easily scraped out, powdered in a clean mortar, passed through bolting cloth, or a fine sieve, and finally rubbed lightly in a clean dry mortar.—Amer. Jour. Pharm., March 1886, 119; from the author's thesis.

Powdered Elm Bark—Adulteration with Wheat Flour.—A correspondent of the "Western Druggist" (Jan. 1886, 10), draws attention to an instance coming under his observation, in which powdered elm bark, labeled "Superfine Flour of Slippery Elm" was composed of *wheat flour* with a small proportion of powdered elm bark.

Baking Powder—Formula.—Mr. S. W. McKeown recommends the following preparation of cream of tartar and soda as making a good baking powder, viz.: Cream of tartar, 7 p.; bicarbonate of sodium, 3 p. To this 2 p. of starch is added, and the material, which must have been previously carefully dried, is thoroughly mixed by sifting.—Amer. Drugg., July 1886, 128; Proc. Ohio State Pharm. Assoc., 1885.

Pulvis Errhinus—Formulas.—Dr. Rabow recommends two kinds of snuff powder, the basis of which is composed of equal weights of roasted coffee and white sugar. The one is composed of an intimate mixture of 100 parts of this powder and 2 parts of menthol; the other by substituting 1 part of hydrochlorate of cocaine for the menthol.—*Amer. Jour. Pharm.*, June 1886, 294; from *Deutsche Med. Wochenschr.*

Antidysenteric Powder—Formula, etc.—The powder made by the following formula is recommended by Mr. Schmitjan as being laxative and antiseptic, and useful in subacute and chronic forms of dysentery: Washed sulphur, 1; powdered fennel, 1; sugar, 2; gum arabic, 2. The dose is a teaspoonful every three hours.—*L'Union Med.*, Jan. 17, 1886.

Dusting Powder of Sulphite of Zinc and Steatite—Formula.—Mr. Pierre Vigier recommends a powder made according to the following formula as being a useful application to excoriations: Hydrated oxide of zinc (see under "Inorganic Chemistry"), 1 p.; steatite (soapstone), 9 p. M.—*Amer. Jour. Pharm.*, 1886, 294; from *Gaz. Hebdom. Med. Chir.*, Febr. 5, 1886.

RESINÆ.

Podophyllum—Criticism of the Requirements of the German Pharmacopœia.—Dr. A. B. Lyons observes that complaints are made in the German market that foreign podophyllin is not of the right color, and that it is not completely soluble either in alcohol or in ammonia. Frequently the aqueous solution fails to produce with ferrichloride the required dark color, and the proportion of inorganic matter contained in the podophyllin often exceeds the limit of one per cent. Dr. Lyons has thoroughly inquired into the matter. He finds that resin of podophyllum, "prepared by precipitating an alcoholic extract of the drug with water," does not dissolve completely in ten times its weight of alcohol, or in one hundred times its weight of water of ammonia. None that he has examined, no matter how, or how carefully prepared, has answered this implied requirement of the German Pharmacopœia. In point of fact all of his tests and experiments tend to show that it is impossible to prepare a podophyllin agreeing with the German Pharmacopœia. and that the tests of that standard are hypercritical. One noteworthy circumstance is mentioned by the author. It is this, that resin of podophyllum prepared in the usual manner yields when shaken with water a nearly colorless solution, which shows no darkening by ferrichloride; but the same resin, after treatment with petroleum ether, gives an aqueous solution which is colored more or less by ferric salts.—*The Pharm.*, Oct. 1885, 309; from *Proc. Mich. State Pharm. Assoc.*, 1885.

SAPONES.

Soap—Estimation of Free Alkali.—Mr. C. Thompson draws attention to the methods employed for the determination of "free alkali" in soaps,

and makes some observations on their relative reliability. There are three principal methods employed.

(1) The *alcohol test*, which is carried out as follows: About 5 grams of the soap are dried, boiled with strong (preferably absolute) alcohol, and filtered through a hot water funnel. The filtrates and washings (amounting together to about 120 cc.) are then titrated with alcoholic soda or acid, using phenolphthalein as indicator, so as to ascertain the positive or negative alkalinity of the solution—negative alkalinity indicating free acid or diacid salt. The residue on filter, consisting of carbonates and other matter insoluble in strong alcohol, is then titrated in the usual way, and the total alkalinity taken as the algebraic sum of the two titrations.

(2) The *fatty acid titration test*, which consists in taking five or ten grams of soap, dissolving in water, adding excess of standard acid, separating the fatty acids, titrating back the excess of acid in filtrate with standard soda, in this case using cochineal as indicator, and thus arriving at the total alkali present, then dissolving the separated fatty acids in alcohol and titrating with alcoholic potash or soda with phenolphthalein as indicator. By subtracting the amount of alkali equal to the fatty acids, the quantity of "free alkali" is obtained.

(3) The *salting out test* is best carried out by dissolving 10 grams of soap in 100 grams of water, cooling, adding 2 grams of pure common salt, throwing the curdy mass on a filter, filter pumping, and washing with four cc. of brine solution. The free alkali is determined in the filtering and washing.

The author finds the alcohol test to be the preferable one for all purposes, and the only correct one in the case of toilet soaps. Both of the others, however, serve a useful purpose in determining the free alkali in household and laundry soaps.—Phar. Jour. and Trans., Jan. 23, 1886, 635–636.

Soap—Quantitative Valuation of Resin.—The following method is based upon the behavior of NaCl to separate out of a solution of soap only the fat soap, while the resin soap is retained in solution. Dr. Heiner's experiment, made with soap containing 20 per cent. of resin, gave on an average $1\frac{1}{2}$ per cent. less of resin. Two samples of equal weight are treated; one is decomposed with H_2SO_4 , and the fatty acids containing the resin are weighed. Dissolve the other sample in water, treat with solution of NaCl, separate the liquid containing the resin and glycerin from the soap-mass, wash with solution of NaCl, dissolve again in water, precipitate again, wash repeatedly with the salt solution, and decompose the pure soap with H_2SO_4 , and weigh. The difference in weight of the two results gives the weight of resin.—Monit. Scientif.; Centralhalle, Nov. 25, 1885; Amer. Jour. Pharm., August 1885, 383.

Corrosive Sublimate Soap—Preparation of a Stable Article.—Accord-

ing to Dr. Geissler, a stable soap can be made by mixing corrosive sublimate with soap containing an excess of fatty acid (not fat). If the soap contains an excess of alkali dark spots appear and gradually get larger until the soap turns black and lastly silver-gray. This does not occur in soap made as Geissler suggests, hence color can be considered a criterion of efficacy. Prof. Johne experimented with a 1 per cent. corrosive sublimate soap, and found it to be a powerful disinfectant.—*Amer. Jour. Pharm.*, April 1886, 165.

SPIRITUS.

Spirit of Nitrous Ether—Assay.—Prof. Charles O. Curtman criticises the U. S. P. method for the assay of spirit of nitrous ether. He finds that the indirect method gives more correct results; *i. e.*, the addition of permanganate of potassium in excess, and titrating back the excess employed when the reaction is complete. Even here certain precautions must be observed, for which see the author's paper in "*Pharm. Rundschau*," May 1886, 104-105.

Sweet Spirit of Nitre—Instability.—Mr. Edward Davies communicates some of the results of some experiments which prove the extreme rapidity with which the spirit of nitrous ether is liable to undergo change. A spirit corresponding to the tests of the Pharmacopœia (B. P.) fell in eight days from the maximum to the minimum requirements of that standard, though kept under highly favorable conditions. *Pharm. Jour. and Trans.*, March 6, 1886, 773-774.

Spirit of Nitrous Ether—Preservation.—Mr. George E. Perry has made some experiments which again point out the necessity of preserving spirit of nitrous ether in well filled bottles and in a cool, dark place. A quantity of the spirit, assaying when purchased 4.10% of ethyl nitrite, was placed in the shop bottle, and another portion of the same spirit was placed in the cellar in a bottle about three-fourths full, but kept closely stopped until nearly all of that in the shop bottle had been dispensed, when both portions were again assayed. That kept in the shop bottle now contained 1.77%, while that kept in the cellar contained 3.58% of ethyl nitrite.—*Phar. Jour. and Trans.*, Aug. 8, 1885, 125.

Spir. Ammon. Arom.—Modification of B. P. Process of 1885.—Mr. Geo. H. Seward suggests a modification of the new process of the B. P. for aromatic spirit of ammonia, which modification consists in introducing less water into the still and in distilling slowly, thereby securing all of the modified spirit in the distillate. He considers the following quantities to be the smallest that can conveniently be worked by this process:

Take of Rectified Spirit	30 pints.
Oil of lemon	℥iv 3ss.
Essential oil of nutmeg	℥ij ʒviss.
Distilled water	10 pints.

Mix and distill slowly 34 pints. Dissolve volcanic carbonate of ammonia 20 ounces, distilled in water 4 pints, add 2 pints strong solution of ammonia, and mix this with the distillate. Product 5 gallons, sp. gr. 0.896.—Phar. Jour. and Trans., Feb. 20, 1886, 701.

Aromatic Spirit of Ammonia—Critical Examination of the Different Pharmacopœial Processes.—A. Gertrude Flanders records the result of a number of experiments made to determine the relative merits of different pharmacopœial processes for the preparation of aromatic spirit of ammonia, as well as the modifications of the same that have been proposed. The conclusion arrived at is that distillation seems to be necessary to obtain a colorless spirit, and that its appearance is to be a standard by which its worth is to be estimated. This process will give the most desirable article for the market.—Proceed. Mich. State Pharm. Assoc., 1886, 163-167.

Artificial Fruit Essences—Formula.—Mr. Luther P. Bowers recommends the following as good formulas:

	Artificial fruit essence of		
	Pine apple.	Raspberry.	Strawberry.
Ethyl acetate	4 parts.	6 parts.	3 parts.
Amyl acetate	4 “	1 “	4 “
Ethyl butyrate	4 “	—	—
Chloroform	1 “	—	—
Spirit of nitrous ether	—	1 part.	1 part.
Tartaric acid	—	1 “	1 “
Tinct. orris root (10 per cent.) .	—	24 “	24 “
Glycerin	—	24 “	24 “
Diluted alcohol	sufficient for 200 parts.		

—Amer. Jour. Pharm., Jan. 1886, 13.

Spiritus Odoratus, U. S. P.—Improvement.—According to Mr. Luther P. Bowers, the pharmacopœial formula would be improved by reducing the oil of bergamot to 14 parts, and increasing the acetic ether to 4 parts.—Amer. Jour. Phar., Jan. 1886, 13.

SUCCI.

Lime Juice—Examination of Commercial Samples.—Mr. Daniel Herr Hassler has examined several commercial samples of lime juice, the results being tabulated below. The percentage of free acid was determined volumetrically. Of the acids not mentioned in the table, oxalic and malic acids were not found in any one of the samples. No. 6 showed a trace of tannin, No. 4 a trace of nitrate, No. 3 a trace of tartrate, and No. 7 a trace of acetic acid.

Sample.	Color.	Odor.	Taste.	Specific gravity	Chloride.	Sulphate.	Citric acid, percent	Ash, percent.
1. Monserrat .	{ Bright straw.	Pleasant.	{ Pleasantly acid.	1.044	Trace.	—	8.54	.540
2. Von Lear .	{ Light amber.	{ Slight, pleasant.	{ Intensely acid.	1.020	Trace.	{ Slight prec.	8.12	.515
3. Cowdrey .	{ Dark amber.	Pleasant.	{ Bitter and acid.	1.041	{ prec.	{ prec.	7.60	.523
4. Jamaica .	{ Reddish-brown, cloudy.	Musty.	{ Bitter and acid.	1.034	{ Medium prec.	{ Medium prec.	7.42	.415
5. Martinique .	{ Light straw.	{ Slightly musty.	{ Acid and bitter.	1.042	{ Slight prec.	{ Medium prec.	6.76	.492
6. Rose . . .	{ Cloudy straw.	Unpleasant.	Bitter.	1.023	{ Slight prec.	{ Dense prec.	6.02	.480
7. Octo . . .	{ Light straw.	{ Slightly musty.	{ Sweetish acid, then bitter.	1.026	—	{ Medium prec.	2.80	.405

—Amer. Jour. Pharm., Jan. 1886, 14; from the author's thesis.

Raspberry Juice—Preservation by means of Salicylic Acid.—A writer in "Pharm. Rundschau" (xii. 82), suggests that raspberry juice can be preserved by adding 20 gms. of salicylic acid to 100 liters of juice; also by the addition of 15 per cent. of 96 per. cent alcohol. Salicylic acid is preferable to alcohol for several reasons. When the juice is preserved with alcohol it soon loses its bright red color, turning violet, and gradually acquires a strong ethereal odor, losing in this way the natural aroma, whilst juice preserved with salicylic acid retains its natural color and odor and yields a clear syrup when boiled with sugar.—Amer. Jour. Pharm., April 1886, 165.

SUPPOSITORIA.

Non-fatty Base for Bougies.—Dr. Hunter Mackenzie recommends a gelato-glycerin basis, suitable for nasal bougies, the formula for which is as follows: Gelatin, 5j; distilled water, ʒiiss; soak for twelve hours, then add glycerin, ʒiiss, and dissolve in a water-bath.—Edin. Med. Jour., Aug. 1885; Pharm. Jour. and Trans., Aug. 22, 1885, 172.

Suppositories of Quinine—Manipulation.—To prevent the irritating effect sometimes observed when these suppositoriæ are made with sulphate of quinine, Mr. J. Addison Eberly recommends the trituration of the salt with a small quantity of water until a perfectly smooth paste is obtained, then rubbing well with the cacao butter and moulding in the manner directed by the Pharmacopœia. Bisulphate of quinine does not yield satisfactory suppositories by dissolving the salt in a small quantity of water; they are best prepared by rubbing the crystals with a little olive oil to a smooth pasty mass, incorporating this with the cacao butter, and moulding.

Suppositories of Carbolic Acid will be free from small globules of phenol and destitute of caustic properties, if the carbolic acid is dissolved in a portion of the cacao butter with the aid of heat.—Amer. Jour. Pharm., Feb. 1886, 87; from the author's thesis.

Belladonna Suppositories—Barnouvin's Formula. The following is Dr. Barnouvin's formula :

Extract of Belladonna	0.01 part.
Lard	0.50 part.
White wax	1.00 part.
Cacao butter	3.00 parts.

If these quantities are taken in grams (for instance cacao butter 3 grams), the above proportions represent one suppository.—*Amer. Drugg.*, Nov. 1885, 218.

Menthol Bougies—Formula and Uses.—Dr. Rosenberg recommends the application of gelatin bougies, containing one-sixth grain of menthol, for the relief of reflex neuroses due to nasal disease.—*Weekly Med. Rev.*, April 24, 1866.

Paraldehyde Suppositories—Preparation.—Dr. Sauter has employed paraldehyde suppositories with satisfactory results. Each suppository should contain 1 gramme (15 grains) of paraldehyde. They may be made by allowing the paraldehyde to solidify in a glass bottle, in a water-bath, with twenty per cent. of paraffin, and this gelatinous mixture introduced into the suppositories.—*Der Fortschritt*, August 5, 1883.

SYRUP.

Officinal Syrups—Modified Formulas.—Mr. J. Lewis Nebinger, after experimenting with a number of syrups, suggests the following modifications of the officinal formulas.

Syrupus Acaciæ.—The process of 1870 is far superior to the present one. The syrup should be made of select pieces of gum and in small quantities, and should be kept in a cool place.

Syrupus Ferri Iodidi.—Using the quantities directed by the pharmacopœia, a syrup is first made of 300 parts of sugar and 150 parts of water, and transferred into a tared vessel. The solution of ferrous iodide is made with 150 parts of water and filtered into the syrup, followed by 25 parts of distilled water previously used for rinsing the flask in which the iron solution had been made. After the addition of 300 parts of sugar, solution is effected with the aid of heat, and enough distilled water is added to make 1,000 parts.

Syrupus Ipecacuanhæ.—Dilute 20 parts of fluid extract of ipecac with 133 parts of water, set aside for three days, filter, and in the filtrate dissolve 247 parts of sugar without heat.—*Amer. Jour. Pharm.*, Feb. 1886, 86, from the author's thesis.

Syrups and Saccharine Juices—Stoppering of Containers.—Mr. Kirstner proposes the use of paraffin (in substance) instead of corks or other stoppers for the hermetic sealing of bottles containing liquids which are prone

to ferment or otherwise deteriorate by coming in contact with the air. This, he says, is particularly applicable to syrups or saccharine juices of all kinds. They are poured, while hot, into perfectly dry bottles, which are filled nearly up to the lip. They are then allowed to stand at rest until cold, during which time all air-bubbles will rise to the surface. Finally a small quantity of melted paraffin is poured over the top, where it forms a firm solid coat on cooling, about the tenth of an inch thick. Such a paraffin stopper is easily removed when the contents of the bottle are required for use, and by collecting the paraffin it can be used again.—*Amer. Drug.*, Nov. 1885, 208; from *Pharm. Ztg.*, 1885.

Glucose Syrup—Adaptability to Pharmaceutic Uses.—Mr. Clay W. Holmes has examined the glucose syrups of the market, viz., glucose table syrup, Vienna glucose, ordinary confectioners' glucose, and finest confectioners' glucose; also solid glucose. He finds none of them, in their present condition, to be adapted to the wants of pharmacy, this being particularly due to the fact that when the syrup is sufficiently reduced in thickness by the addition of water, it shows a strong tendency to ferment.—*Proc. N. Y. State Pharm. Assoc.*, 1886, 199–201.

Simple Syrup—Cause of Offensive Odor.—Mr. A. Drescher attributes the offensive odor sometimes observed in simple syrup to the small quantity of ultramarine used by sugar refiners to overcome the yellow tinge of sugar: the sulphur compound contained in the coloring agent being decomposed was to form H_2S during the fermentive changes, however slight, that syrup is liable to undergo. He recommends the preparation and preservation of simple syrup by boiling the sugar with water for a few minutes, straining through new cloth previously rinsed in boiling water, and filling into clean bottles previously heated up to the boiling point in a water-bath; the bottles ought then to be capped and kept in the cellar.—*Amer. Drug.*, Sept. 1885, 162.

Syrupus Aurantii—Modification of Official Formula.—Mr. George M. Beringer suggests the following modification of the official formula whereby a uniformly satisfactory product is assured:

Take of sweet orange peel, grated or cut from the inner white layer, five parts (5); alcohol, a sufficient quantity; precipitated phosphate of calcium, one part (1); Sugar sixty parts (60); water, a sufficient quantity to make one hundred parts. Macerate the orange peel in five (5) parts of alcohol for seven days, then pack in a percolator, and allow the percolation to proceed slowly. Reserve the first two parts that come through, then add more alcohol and continue the percolation till six (6) parts more are obtained. Evaporate this, at a temperature not exceeding $120^{\circ} F.$, to three parts, and add to the reserved portion. Rub this up with the precipitated phosphate of calcium and then with thirty (30) parts of water gradually added and filter, adding enough water through the

filter to make the liquid weigh forty (40) parts, in which dissolve the sugar by agitation.—*Amer. Jour. Pharm.*, April 1886, 164-165.

Syrup of Wild Cherry Bark—Value of Glycerin in the Formula.—Mr. T. Roberts Baker, in reply to a query respecting the unsatisfactory character of the officinal syrup of wild cherry bark, observes that the author of the query must have had the syrup of the Pharmacopœia of 1870 in his mind. Mr. Baker has since 1872 prepared the syrup with the addition of a quantity of glycerin very nearly corresponding to that directed by the Pharmacopœia of 1880, and has found it uniformly a satisfactory preparation—*Pharm. Rec.*, May 15, 1886, 152; from *Proc. Virg. Pharm. Assoc.*, 1886.

Syrupus Rhei, U. S. P.—Prevention of Mould.—Mr. August Drescher has observed that syrup of rhubarb is best preserved from mould by the addition of borax. It may be added in the same proportion as the carbonate of potassium now added, is conceded to be innocuous, and is chemically compatible with the other ingredients of the syrup. *Pharm. Rec.*, June 1, 1886, 175; from *Proc. New Jersey Pharm. Assoc.*, 1886.

Compound Syrup of Sarsaparilla—Modified Formula—Mr. R. Rothe considers the officinal process needlessly expensive and recommends the following as furnishing a product fully up to the requirements of medicine:

Sarsaparilla, ground	24 troy ounces.
Guaiacum wood, rasped	3 “
Pale rose leaves	2 “
Licorice root, pulverized	2 “
Senna, pulverized	2 “
Oil sassafras	5 minims.
Oil anise	5 “
Oil gaultheria	3 “
Sugar, granulated	96 troy ounces.
Ammonia water 18 per cent.	1½ fluidounces.
Alcohol,	
Water, of each sufficient to make one gallon.	

Mix the oils with the guaiacum wood and then incorporate the licorice root and senna. Add this mixture to the sarsaparilla and mix them well together; add the rose leaves and again mix. To one volume of alcohol add seven volumes of water and mix one and one-third pints of this liquid with one fluidounce of the ammonia water. To the resulting liquor gradually add the mixed powdered drugs; stir them well together and set them aside in a covered vessel for 24 to 36 hours. Pack the mixture into a cylindrical percolator, the lower portion less firmly than the top, forming a column whose height should not exceed its diameter. Now mix one-third of a fluidounce of ammonia water with two and two-thirds pints of the alcoholic mixture, and pour this upon the mixture ad-

justed in the percolator. When all of the liquid has passed under the surface follow with the alcoholic mixture until 4 pints of percolate has slowly passed. Into 62 fluidounces of this percolate pour the sugar, agitate occasionally until most of this is dissolved, decant the syrup, upon the residue pour the reserved 2 fluidounces of the percolate, and when all the sugar is dissolved unite the solution with the decanted syrup and strain through a fine sieve.—*Drug. Circ.*, Jan. 1886, 3-4.

Syrup of Tolu—Acquisition of Benzin Odor by Age.—Mr. Labre attributes the benzin odor of old syrup of tolu to the action of the calcium salts of ordinary water on the balsam of tolu at a higher temperature. The author bases his observation of Mitscherlich's synthesis of benzin, *i. e.*, distilling benzoate of calcium with quick lime, thus forming carbonate of calcium and benzin, $C_{14}H_6O_4 + 2CaO = 2(CaO, CO_2) + C_{12}H_6$. Syrup of tolu made with distilled water does not acquire a benzin odor on standing.—*Amer. Jour. Pharm.*, Dec. 1885, 606; from *Répert. de Phar.*, Oct., 1885, p. 438.

Syrup of Yerba Santa—Formula.—Mr. R. Rother recommends the following formula and method for the preparation of syrup of yerba santa, to be used as a vehicle for quinine, as superior to any of the published formulæ which he has tried:

Yerba santa, "ground".	4 troy ounces.
Magnesium oxide	$\frac{3}{4}$ " "
Sugar granulated	24 " "
Alcohol,	
Water, of each sufficient to make	2 pints.

Mix one measure of alcohol and seven measures of water, and to two fluidounces of this liquid add the yerba santa and $\frac{1}{2}$ troy ounce of magnesia previously mixed. Pack this mixture firmly into a cylindrical percolator, and pour on of the alcoholic dilution until the liquid has descended to the base of the column. After twelve hours' maceration pour on more of the menstruum, until one pint of percolate has slowly passed. Mix this with the remaining magnesia well, and expose to the air for twelve hours. Now filter and in the filtrate dissolve the sugar by agitation, or by means of a gentle heat, and strain through a fine sieve.—*Drug. Cir.*, Jan. 1886, 4.

Syrup of Dried Figs—Suggestion as to its probable usefulness.—See *Ficus carica*, under "Materia Medica."

Horehound and Linseed Syrup—Formula.—The following formula is given in "*Chem. and Drugg.*:" Boil together for ten minutes 1 ounce horehound, 2 ounces linseed, and 1 pint of water. Strain when cold, and dissolve 1 lb. of sugar in the decoction. The product should measure 30 ounces; to this add 5 ounces extract glycyrrhiz. liq., 1 ounce ess. anisi, 1 ounce spt. chloroformi, and 3 ounces proof spirit. Shake well, and allow to stand for a day before bottling.

Dentition Syrup—Formula.—The following formula is given in “*L’Union Méd.*.” Dissolve cocaine hydrochlorate and borax, of each 1 part in syrup of marsh-mallow 20 p., and syrup of poppy 10 p. Use three or four times a day on the gums.—*Amer. Jour. Pharm.*, June 1886, 295.

Ginger Ale Syrup—Preparation.—Mr. Val. Schmidt recommends the following formula and process for making a ginger ale syrup, with which a ginger ale, almost identical with the imported article, can be readily produced. Take of powdered Jamaica ginger, 16 oz.; powdered red pepper, 4 drachms; bicarbonate of potassium, 6 drachms; diluted alcohol, q. s. Dissolve the bicarbonate of potassium in 4 pints of diluted alcohol, percolate the powders with this menstruum, and sufficient diluted alcohol to make 4 pints. With this *extract* the syrup is made as follows: Mix together 36 fluidounces of syrup, 10 fluidounces of diluted alcohol, 4 fluidounces of the above extract, and add sufficient water, in which 2 drachms of citric acid have been dissolved, to make 4 pints. Color with caramel to a sherry color, allow to stand a few hours, filter. From 3 to 4 fluidrachms of this syrup are required for a glass of ginger ale.—*Pharm. Rec.*, Mar. 15, 1886, 92; from *Proc. Calif. Pharm. Soc.*, 1885.

Ginger Ale Syrup—Process of Preparation.—A correspondent of the *Mineral Water Trade Review* describes a process for making a ginger ale syrup. It is of first importance that the ginger root should be good, sound and unbleached. The tincture is prepared by pounding 20 ounces of the root into a coarse powder, which should be rendered uniform by passing it through a sieve of forty meshes to the inch; the granules thus obtained are mixed with a sufficient quantity of dilute spirit, composed of equal parts of alcohol at 60°, and distilled water, so as to form a paste, which is placed in a percolating apparatus, and left to macerate for forty-eight hours. Next pour on dilute spirit, so as to obtain 70 oz. of tincture, press out the mass strongly, and finally add sufficient liquid to make 80 oz. Of the tincture thus prepared take 7 oz., mix with 6 pints of water and sufficient kaolin (china clay), or thoroughly washed whiting may be used; filter through paper so as to obtain a perfectly bright filtrate, in which dissolve 6 lbs. of sugar without heat. This quantity will be found easily soluble in the above proportion of water. This forms the first part of the process, which is completed by the addition of 140 drops of tincture of capsicum berries (obtained by macerating 8 oz. of the bruised berries with 25 oz. alcohol at 60°, and 25 oz. distilled water, and proceed as in making the essence of ginger; the product should measure 50 oz.); also 180 drops tincture of vanilla (made by macerating 1 oz. vanilla pods, thoroughly bruised in a mortar, with 2 oz. distilled water, and 8 oz. alcohol at 60° for eight days); also 6 drops essence of cloves (essential oil of cloves, 1 part; alcohol at 60°, 9 parts), with 30 drops essence of lemon, which quantity will be found perfectly soluble in the syrup, providing

that the quality is good, and 2 oz. of citric acid dissolved in 6 oz. of water. The syrup thus completed may be colored by the addition of burnt sugar as required, and finally filtered with a little paper pulp in the usual way. If it is deemed necessary to give an extra amount of foam, more than exists naturally in the ginger, a most efficient heading may be obtained from the following formula :

Soapwort root (*saponaria officinalis*) in coarse powder, 4 oz.; animal charcoal, 2 oz.; macerate two days in a mixture of alcohol, 60°, 4 oz.; pure glycerin, 4 oz.; distilled water, 8 oz.; then percolate so as to obtain 16 oz. of finished extract. Two drachms of this will be found sufficient for 1 gallon of syrup.—*Amer. Drugg.*, Sept. 1885, 174.

Syrup of Hydrobromic Acid—Formula.—Mr. Coudure recommends to prepare this syrup in the following manner :

Bromine	1 part.
Distilled Water	20 parts.
Oil Peppermint	1 part.
Sugar	38 parts.

Mix the bromine with the water and add the oil of peppermint in drops, agitating constantly, so that the reaction shall take place progressively, and the temperature shall not be raised too high. When the reaction is over, which is indicated by the disappearance of color, transfer the liquid to a wetted filter, and add the sugar.

100 parts of the product contain 12½ parts of bromine.—*Amer. Drug.*, March 1886, 57; from *Bull. Soc. Pharm. Brux.*

Syrup of Ferrous Iodide—Preparation and Commercial Quantity.—Mr. E. J. Mowry, after giving a very interesting historical account of this preparation, and the means that have been suggested from time to time for its preparation, offers the following method for its preparation, the same being based upon the suggestion made by Dr. Squibb in 1873 (see *Proceedings* 1873, 189). The author heats the sugar on a water bath and filters into it the warm solution of ferrous iodide. As the sugar begins to dissolve, the point of the funnel is lowered into the syrup formed; the sugar is completely dissolved when the filtration is ended. Boiling water is added to make up the required amount, and small vials are completely filled with the hot syrup. The straining of the syrup should be avoided by the use of pure sugar, clean lumps of cut loaf sugar being preferred. The use of sulphurous and hypophosphorous acids to preserve the syrup, has given very satisfactory results; but if pure materials are used, and the syrup is bottled while hot, no protection is needed except good corks.

The author has tested thirteen samples as directed by the U. S. P., making duplicate volumetric determinations of strength. Nos. 1–6 were said to be made from reputable manufacturers, Nos. 7–12 were made in Lafayette, and No. 13 was made by the author in the Purdue laboratory.

No. of sample.	Reaction for free iodide.	Per cent. of ferrous iodide.	
1	None.	6.01	} Mean value, 4.82 per cent.
2	Slight.	5.16	
3	Distinct.	5.08	
4	None.	4.37	
5	None.	4.04	
6	Slight.	4.26	} Mean value, 8.44 per cent.
7	None.	8.26	
8	None.	8.48	
9	Slight.	8.42	
10	None.	8.30	
11	Very slight.	10.24	}
12	None.	6.94	
13	None.	10.10	

Nos. 7 and 13 were of a transparent pale green ; the rest were either colorless or contained free iodine. The U. S. P. requires 10 per cent. of ferrous iodide ; and the data in the table speak for themselves.—*Amer. Jour. Pharm.*, June 1886, 289-291.

Syrup of Iodide of Iron—Restoration.—Mr. Val. Schmidt finds that syrup of iodide of iron that has become brown or partially decomposed may be restored to its original light green color by heating it to the boiling point with a little metallic iron.—*Pharm. Rec.*, March 15, 1886, 89 : from *Proc. Cal. Pharm. Soc.*, 1885.

Syrup of the Hypophosphites.—*Formula.*—Mr. W. A. Spalding recommends the following modification of the officinal syrup, which, he states, affords a more satisfactory preparation, and is, moreover, readily clarified by filtration. Dissolve 12 parts each of the hypophosphites, calcium, sodium, and potassium in 350 parts of water, filter the solution, dissolve in this 614 parts of sugar, and filter the resulting syrup if necessary. The author also recommends the following as being a good formula for

Syrup of Lactophosphate of Calcium.—Carb. calcium, 12 p.; lactic acid, 33 p.; phosphoric acid (not dilute), 18 p.; sugar, 600 p.; water to make 1000 p. The author prefers the flavor of lemon to that of orange flower water. *Phar. Rec.*, Feb. 15, 1886, 59 ; from *Proc. Conn. Pharm. Assoc.*, Feb. 1886.

Syrup of Hypophosphites Compound with Quinine and Strychnine.—*Formula.*—Mr. Charles E. Dohme has devised the following formula as the result of experiment, and recommends the same as furnishing a clear and permanent syrup.

Take of Hypophosphite of calcium	740 grains.
Hypophosphite of sodium	256 "
Hypophosphite of potassium	192 "
Hypophosphite of manganese	192 "

Sulphate of iron (crystal)	370	"
Strychnine	4	"
Sulphate of quinine	128	"
Diluted sulphuric acid	q. s.	
Diluted hypophosphorous acid	q. s.	
Sugar	24	troy ozs.
Orange flower water	1	oz.

Dissolve 228 grains hypophosphite calcium in 4 fluidounces of distilled water, and the sulphate of iron in two fluidounces distilled water, mix and filter. Dissolve the remainder of the hypophosphite of calcium, together with hypophosphites of sodium, potassium and manganese, in four fluidounces hot distilled water, using about one or two fluidrachms of diluted hypophosphorous acid to dissolve them, mix with the two solutions, and set aside. Dissolve the strychnine in two drachms of distilled water, by the aid of a few drops of hypophosphorus acid, and again mix with the other solutions. Now dissolve the sulphate of quinine in about eight ounces of water, using sufficient diluted sulphuric acid to dissolve it, and precipitate the quinine with sufficient aqua ammonia (about one part to six of water), until ammonia is in slight excess. Wash the precipitated quinine on a fine muslin strainer, and transfer the moist light quinine to a mortar or small dish. Drugg. Circ., March 1886, 69; from Proc. Maryland Pharm. Association.

Syrup of Hippurate of Calcium—Formula.—The following formula is given in "Rép. de Pharm." (1885, 434):

R. Acid hippuric, pure	I.
Milk of lime	q. s.
Hot water	20 cc.
Sugar	24.
Spirit of limon.	0.15.

To a portion of the water, heated to 75 or 80°C., add the acid and milk of lime; agitate, and test from time to time with test paper, until the solution is slightly alkaline; add balance of water and sugar and heat over a gentle fire. The solution of hippurate of calcium is the same without the sugar.—Am. Jour. Pharm., Dec., 1885, 605.

TINCTURÆ.

Tincture—Maceration vs. Percolation.—Mr. G. H. Charles Klie criticizes the directions of the U. S. P., 1880, for the percolation of drugs, and expresses the opinion that the preliminary maceration either for the preparation of tinctures or of fluid extracts is entirely superfluous, provided the operator thoroughly understands how to pack the moistened powder. The author makes some general remarks on the preparation of tinctures, as well as on percolation, which will be consulted with interest in "Pharm. Rundschau," Aug. 1885, 173-174.

Tincture of Aconite Root—Assay.—Mr. Adam Conrath has examined commercial tincture of aconite root by determining the amount of precipitate yielded from 100 cc. of the sample by iodohydrargyrate of potassium. The alcohol was evaporated from each sample, the residue diluted with water to 15 cc. and allowed to rest for a few hours, the liquid filtered from precipitated resin; the resin was redissolved in alcohol, mixed with water, the alcohol distilled off, and the aqueous liquid when cool and after standing filtered off as before—this treatment being repeated until 40 cc. of total aqueous filtrate was obtained. The filtrate was now acidulated with hydrochloric acid, precipitated with Mayer's solution in moderate excess, digested in warm water for half an hour, allowed to cool, the precipitate collected on a double filter, washed with 15 to 30 cc. of water according to bulk, dried to constant weight, and its absolute weight determined by using the outer filter as a counterpoise for the inner. Eight samples thus treated gave respectively .400, .312, .213, .253, .7-0, .180, .330, and .150 gram of precipitate from 100 cc. of tincture. The author expresses the opinion that by the above treatment a properly prepared tincture of aconite root should yield from 100 cc. not less than .250 nor more than .350 gram of precipitate.—West. Drugg., Sept. 1885, 231-233; from Proc. Wisc. Pharm. Association, 1885.

Tincture of Nux Vomica—Modified Formula.—In a former communication (see Proceedings, 1883), Mr. R. Rother had given a formula in which he recommended the use of chloride of sodium to precipitate the extraction of nux vomica by a dilute alcoholic menstruum. For reasons which he details at some length, he has been led to substitute the sodium by the corresponding calcium compound, and now recommends the following process:

Take of Nux vomica "pulverized" 4 troy ozs.
 Calcium chloride,
 Alcohol,
 Water, of each sufficient to make 1 pint.

Mix alcohol and water in equal measure, and in one fluidounce of this mixture dissolve two drams of calcium chloride. Into this solution gradually stir the pulverized nux vomica, and when thoroughly mixed, pack the moistened powder into a percolator forming a column as high as its diameter. During the packing introduce several filter-paper disks exactly covering the column, and pack the lower portions of the powder less firmly than the top. Again mix alcohol and water in equal volumes as before, and in each pint of the mixture dissolve one drachm of calcium chloride. Pour this solution upon the column of packed powder until one pint of tincture has slowly passed.—Drugg. Circ., April 1886, 78.

Tincture of Nux Vomica—Commercial Quality.—Mr. E. J. Yeager, employing the method of Messrs. Dunstan and Short (see Proceedings

1884, 104), for the estimation of alkaloid in tincture of nux vomica, which method he finds fairly correct, though giving results that are somewhat too low,—subjected seven samples of the tincture to examination, with the following results :

No. 1	contained	0.20	per cent.	alkaloid.	} Mean value, 0.24 per cent.
" 2	"	0.36	"	"	
" 3	"	0.31	"	"	
" 4	"	0.13	"	"	
" 5	"	0.25	"	"	
" 6	"	0.20	"	"	
" 7	"	0.45	"	"	

No. 7 was prepared by the author, according to the directions of the U. S. P., and is nearly twice as strong as the mean of the other samples, while Nos. 1-6 show a variation in strength nearly in the ratio of one to three. The author appends a bibliographical note on nux vomica, which may be referred to with profit.—*Amer. Jour. Pharm.*, June 1886, 291-293.

Tincture of Nux Vomica.—Percentage of Alkaloid in extract obtained by alcohol of different strengths.—See *Extract of Nux Vomica*, under "Extracts."

Tinctures of Opium—Preparation.—Mr. R. Rother recommends the following formula and process for the preparation of tincture of opium: Take of opium, air-dried, and in No. 24 powder, 8 ozs; glycerin, 1 pint; alcohol, water, of each sufficient quantity. Mix the glycerin with one pint of water and 2 pints of alcohol, and add the powered opium. After macerating for two days, with frequent agitation, pour the mixture upon a plain filter, and when all the liquid has drained through, follow with a mixture composed of equal measures of alcohol and water until one gallon of tincture is obtained.—*Drugg. Circ.*, March 1886, 52-53.

Tincture of Opium, B. P.—Determination of Strength of Commercial Specimens.—Mr. W. P. Want has determined the specific gravity and strength of six commercial specimens of tincture of opium, with the following results :

	1	2	3	4	5	6
Specific gravity.	0.937	0.936	0.931	0.936	0.939	0.935
Percentage of Morphine,	A. 0.762	0.751	0.593	0.732	0.766	0.723
	B. 0.740	0.757	0.586	0.751	0.770	0.714
Grs. of Morphine per oz.	3.34	3.3	2.6	3.3	3.4	3.18

Two assays of each sample were made, designated A. and B.—*Pharm. Jour. and Trans.*, May 15, 1886, 959.

Alkaline Tincture of Capsicum—Preparation.—The objection to the present tincture of capsicum, for the preparation of which strong alcohol is employed, is that it forms a turbid mixture with water. Mr. R. Rother

has long employed a process which assures the perfect extraction of the capsicum with a dilute acoholic menstruum. It consists in macerating 4 troy ounces of capsicum pods with one gallon of diluted alcohol, in which 120 grains of potassic hydrate are previously dissolved. After six or eight days, during which time the mixture is occasionally shaken, the tincture is filtered off.—*Drugg. Circ.*, Jan. 1886, 4.

Alkaline Tincture of Cantharides—Preparation.—Mr. R. Rother has for a long time applied an alkaline menstruum in preparing the tincture of cantharides. The unbroken flies are extracted by maceration, but the tincture does not filter readily and clear without the addition of some clarifying powder. Furthermore, after a certain time the clear tincture again gets turbid from the separation of an insoluble earthy soap. A second filtration through magnesium oxide now rapidly gives a tincture which permanently retains its beautiful clearness. The tincture is prepared as follows :

Cantharides, whole	1 troy ounce.
Potassic hydrate	30 grains.
Magnesium oxide	$\frac{1}{4}$ troy ounce.
Alcohol,	
Water, of each sufficient.	

Dissolve the potash in 20 fluidounces of water, and add alcohol to the measure of 2 pints. To this add the catharides and let macerate for 6 or 8 days, shaking the mixture at occasional intervals. Now strain the tincture off, add the magnesia, shake the mixture occasionally during a period of several hours and filter. Should the tincture become turbid after some time, filter it again through magnesia as before.—*Drug. Circ.*, Jan. 1886, 4.

Tincture of Vanilla—Preparation from Vanillin and Coumarin.—Mr. R. Rother considers the officinal formula for this tincture very unsatisfactory. The alcohol is too strong and sugar is unnecessary. A much better preparation is obtained from vanillin, a quantity of which, equivalent to that contained in good pods, costs only about half the price of the latter. The author recommends the following formula as producing a very satisfactory tincture:

Vanillin, crystallized	3 drachms.
Coumarin, crystallized	1 drachm.
Caramel, liquid	2 fluidrachms.
Glycerin, ...	4 fluidounces.
Alcohol	2 pints.
Water, ...	sufficient to make 1 gallon.

Dissolve the vanillin and coumarin in the alcohol and add four pints of water. Mix the caramel and glycerin with one pint of water and pour it into the first solution, together with enough more water to make the

tincture measure one gallon, and filter it if necessary.—*Amer. Jour. Phar.*, Oct. 1885, 500-502.

Tincture of Euphorbia Pilulifera may be made in the proportion of 1 part of the dry herb to 5 parts of proof spirit, and given in doses of 10 to 30 drops. See *Euphorbia Pilulifera* under "Materia Medica."

Tincture of Soap-Root—Formula.—Suitable for *Ginger Ale Syrup*, which see.

Tinctura Avenæ Sativæ—Preparation, etc.—Mr. Henry E. Heinitch has prepared the tincture from oats with the husks, from the husks alone, and from the grain deprived of the husks. Four troy ounces of the ground material were macerated and displaced with diluted alcohol, 5½ fluidounces of the percolate were reserved, the remainder evaporated to an extract and this was dissolved in the reserved portion, sufficient diluted alcohol being added to obtain 6 fluidounces. The first two tinctures yielded 3 per cent. of extract, while 3½ per cent. were obtained from the tincture of the grain.—*Amer. Jour. Pharm.*, Feb. 1886, 86; from the author's thesis.

Yerba Santa Tincture of Cinchona—Formula.—Mr. R. Rother considers that the serpentaria in compound tincture of cinchona might well be replaced by yerba santa, and the orange peel by the essential oil. The yerba santa appears to exercise peculiar extracting qualities on the alkaloids of the bark. The process is as follows:

Cinchona bark	6 troy ounces.
Eriodictyon leaves	1½ " "
Diluted alcohol, sufficient to make	2 pints.

Powder the cinchona bark and pass it all through a No. 24 sieve. Powder the eriodictyon leaves, and having separated the finer portion by means of a No. 20 sieve, mix it with the powdered cinchona. Gradually add this mixture to two fluidounces of diluted alcohol and pack it firmly into a cylindrical percolator. Moisten the coarser portion of the powdered leaves with one fluidounce of diluted alcohol and pack it also into the percolator. Now pour on diluted alcohol, and when this has slowly reached the base of the column, check the percolation by closing the exit. Resume the percolation at the end of 24 hours and pour on diluted alcohol as before, until two pints of percolate have slowly passed. *Drugg. Circ.*, Jan. 1886, 4.

Oily Tincture of Iodine—Formula.—The following formula is given by Greuel for an oily tincture of iodine: Iodine 10; castor oil, strong alcohol, of each 45 parts. *Amer. Drugg.*, Sept. 1885, 169; from *Arch d. Phar.*, 1885.

TROCHISCI.

Trochisci Pimentæ Foliorum—Preparation.—Mr. Wm. Warner Abell has made these by incorporating 1 gram of the extract (which see) in the

usual manner, so as to form 30 troches. They have a fine aromatic and astringent taste.—*Amer. Jour. Pharm.*, April 1886, 163.

VINA.

Vinum Ipecacuanhæ.—*Examination of Commercial Samples*.—Mr. Leopold Peters has examined specimens of wine of ipecac, purchased at 49 different stores, with the object of ascertaining the alcoholic strength of the preparation. The Pharmacopœia directs the menstruum to contain not less than 20 per cent. by weight of absolute alcohol. The process followed was evaporation of the alcohol and calculating the strength from the difference in specific gravity, as directed by the Pharmacopœia. The results are placed in four groups, namely about 1.06 per cent. of alcohol in 9 specimens; about 3.71 per cent. in 16 specimens; 6.57 per cent. in 14 specimens, and 13.15 per cent. in 10 specimens. An alcoholic strength of between 12 and 15 per cent. by weight is considered to be sufficient for the preservation of this preparation.—*Amer. Jour. Pharm.*, February 1886, 85; from the author's thesis.

Vinum Ipecacuanhæ, B. P..—*Improved Manipulation*.—Mr. Peter Boa finds that when the ipecacuanha is extracted by maceration and percolation with dilute acetic acid instead of preliminarily maceration with strong acetic acid, as required by the B. P., the resulting extract is about the same in weight as that obtained by the B. P. process, but the root is more completely exhausted, and the extract is more readily evaporated to complete dryness. The weight of dry extract from one ounce of root was found to average about 84 grains. In the most successful percolation the author macerated the root (1 oz.) with $1\frac{1}{2}$ ounce of acetic acid and 2 ounces of water, percolated with the remaining $1\frac{1}{2}$ ounce of acid in 17 ounces of water, and finished with water to make 20 ounces of percolate. The tendency of the wine to form a deposit may, in the author's opinion, be best prevented by the addition of sugar, or by employing a sweet wine as free as possible from tannic acid.—*Pharm. Jour. and Trans.*, Jan. 30, 1886, 652.

Mr. T. Maben has contributed a paper on the same subject, in which he makes some important suggestions. He regards it unnecessary to evaporate the acetic extract to complete dryness, and therefore suggests that the evaporation be continued to a thin syrupy condition only. The percolation, also, need not be continued as far as directed by the B. P., twenty ounces from one ounce of root being amply sufficient. To secure the stability of the wine it becomes, in the author's opinion, necessary to completely remove the tannin from the wine. This is best accomplished by means of gelatin. The proposition to standardize the wine, in so far as the emetine is concerned, is in the author's opinion impracticable and unnecessary.—*Ibid.*, 652-653.

Orange Wine.—*Production in Florida, etc.*.—According to a note in

"Gardener's Chronicle," the manufacture of wine from oranges is developing into a very extensive business in Florida. Wine made from this fruit is said to have formed a large proportion of the "sherry" of commerce, since the trouble caused by the *Phylloxera*.—Pharm. Jour. and Trans., Feb. 27, 1886, 724.

Orange Wine—Preparation.—Pour upon the peel of two or three oranges, placed in a vessel, 1 liter of hot white wine; cover and set aside for three hours. Dissolve 625 grams of sugar in half a liter of pure water; mix the resulting syrup when cold with the vinous infusion, and if desired color with saffron; filter and bottle.—Science Pratique; Leitm. Rundschau, 1885, p. 432; Amer. Jour. Pharm., Oct. 1885, 505.

MISCELLANEOUS FORMULAS.

Nutritive Biscuit—A New Food for Infants.—Mr. H. O. Opel, of Leipzig, has undertaken the manufacture of a nutritive biscuit for infants under the supervision of Dr. George Kerne.

The *nutritive biscuit* is intended for infants after they have reached the age of about four months, but is also quite agreeable to adults, and particularly strengthening to nursing mothers. It is prepared from the best wheat flour, which is mixed with sugar, malt yeast, table salt, condensed milk and nutritive salts, in such proportions that the finished product has the composition given below. The nutritive salts are prepared by a pharmaceutical chemist, and, according to an assay by B. Kohlmann, made for the pharmaceutical district society of Leipzig, contain in 100 parts 6.66 phosphorus, 65.50 oxygen, 5.17 hydrogen, 3.00 carbon, 10.00 calcium, and 9.67 sodium. The dough, properly made, is set aside in a warm place for about an hour and a half, is then placed in suitable moulds, and when sufficiently porous is baked at a dry heat of 200°C. After removal from the oven the cake is exposed to the air for 24 hours, and is afterwards slowly roasted at a temperature of 100°C.

The analysis by B. Kohlmann showed a composition in 100 parts of biscuit of moisture 9.76, aliments of respiration 74.94 (including sugar 5.86), plastic aliments (albumen, etc.) 8.56, fat 2.58, inorganic constituents 4.16 (including calcium phosphate 2.25).

Properly preserved, the biscuit remains good for a long time. It has been used by Dr. Fürst of Leipzig, Prof. Demme of Bern, and many other physicians, with good success. The average weight of this nutritive biscuit is not given; but it is stated that two biscuits a day are sufficient for an infant between 3 and 6 months old, and four or five biscuits for a child a year old. The biscuit is softened in good warm cow's milk, which if necessary is suitably diluted with water, or it may be taken with tea, chocolate or beef tea. Dr. Fürst states that babies over 6 months old usually like this biscuit well, digest it properly, and are not subject to glandular swellings, as is often the case if fed on ordinary pastry or

farinaceous food.—*Amer. Jour. Pharm.*, Dec. 1885, 607; from *Zeitschr. d'Allg. Oest. Apoth. Ver.*, 1885, 406-408.

Antiseptics—Objections to Boric, Salicylic and Benzoic Acids.—Messrs. Sulman and Berry describe the results of experiments made to test the antiseptic value of various boric, salicylic and benzoic acid compounds that have been brought forward as preservatives, especially in regard to their capability of preserving milk. In the presence of the physiological evidences gathered, the authors express themselves adverse to the employment of *boric acid* or *borates* as preservatives of food, and especially of milk, in consequence of the greater risk to children. On the same ground there is still more serious objection to the use of *salicylic acid* or *salicylates*, which moreover are found utterly useless for these purposes. *Benzoic acid* proved objectionable on account of its tendency to precipitate casein, but *benzoate of sodium* gave good results. It has the advantage of being tasteless, one-third more powerful than boric acid, and non-injurious when taken in small quantities for prolonged periods.—*Pharm. Jour. and Trans.*, April 3, 1886, 838; *Chem. News*, March 12, 1886, 130.

Iodol Gauze—Preparation.—According to "*Pharm. Rundschau*" (xii. 205) iodol gauze is prepared by saturating gauze in a solution of 1 part each of iodol, resin and glycerin in 10 parts of alcohol. Iodol is odorless and does not produce intoxication, and hence is preferable to iodoform.

Iodated Phenol—Uses, etc.—This preparation is made by dissolving 4 grains of iodine in $1\frac{1}{4}$ oz. of glycerin, and adding 4 grains of phenol. It has been advantageously used by Dr. Rosenfeld (*Centralbl. Ges. Therap.*) for dysentery in children, in the form of enema, prepared from one or two teaspoonfuls of the mixture and a glassful of water, to be given three times a day.—*Amer. Jour. Pharm.*, January 1886, 14.

Alkaline Tooth-wash—Formula.—Mr. Vigier recommends the following formula for an alkaline tooth-wash: Dissolve sodium bicarbonate 20 grams in distilled water 980, and add sufficient distilled spirit of peppermint. Triturate 20 drops of the best oil of peppermint with magnesium carbonate 2 grams, afterward with the above solution, gradually added, and filter.—*Amer. Jour. Pharm.*, February 1886, 104; from *Gaz. Hebdomadaire*.

Tooth-ache Remedy—Formula.—Prof. Ludovici, in "*Pharm. Italian.*" recommends: Dry extract of opium, camphor, balsam of Peru each 0.5, mastic 1, chloroform 10. To be applied in the cavities of carious teeth.

Silvering Mixture—Formula and Application.—The following, given in "*La Nature*," appears to be a useful formula: Triturate together 12 p. of nitrate of silver, 30 p. cream of tartar, and 50 p. common salt, until a very finely divided powder is obtained, then triturate with a little water to form a homogeneous paste; keep the paste sheltered from the

light. To silver, rub the copper or brass article with the paste, previously separating the verdigris from the copper, until it is thought that the layer of silvering is thick enough; then wash and wipe hard with a chamois-skin.

Butter Coloring—Preparation from Curcuma—The following formula is given in "Pharm. Rundschau" (xii. 192): Digest 2 parts of curcuma with 10 parts of olive oil, and filter.

Fly Plates (Paper)—Preparation.—Mr. Adolph Vomacka prepares fly-plates—which have hitherto been prepared with arsenic—by substituting a harmless preparation of quassia (see also *syrup of quassia*, Proceedings 1885, 90) for the poison. He recommends the following method: 150 parts of Surinam quassia are thoroughly boiled with 400 parts of water, and the strained decoction concentrated to 50 parts. On the other hand, a tincture is prepared from 25 parts of long pepper and 80 parts of dilute alcohol, by macerating for three days, filtering and coloring with fuchsine. This tincture is mixed with the extract of quassia, the mixture allowed to settle, the clear liquid heated, and 10 parts of chloride of cobalt and 2 parts of tartar emetic dissolved in it. Plates made of coarse bibulous paper are dipped into this solution, and when saturated, set aside to dry. If it is desired to employ arsenic, a small quantity of arsenious acid [about $\frac{1}{2}$ part] is dissolved in the liquid instead of the cobalt and tartar emetic. Amer. Drugg., Aug. 1885, 147; from Rundschau (Leitmeritz).

Ink for Type-Writer Ribbons.—Mr. Isidore Furst gives several formulas for inks to be used on type-writer ribbons, which appear to be useful. The directions for preparing these inks are quite explicit and evidently must be followed accurately. Hence reference must be had to the original paper in Amer. Drugg., May 1886, 81.

Non-Corrosive Indelible Inks—Formulas.—Mr. Richmond states that indelible inks which are not affected by acids, can be made as follows: *Dark-blue* = 3 parts ferro-cyanide of potassium, 2 parts concentrated aqua ammoniæ, 2 parts tartaric acid, and 240 parts of water are mixed, the solution filtered, and 160 parts ammonio-citrate of iron, 40 parts aqua ammoniæ, 8 parts aniline-blue and 70 parts of gum arabic are added. *Black ink* is made by adding 20 parts of pyrogallic acid to the above. These inks being non-corrosive, can be used with an ordinary pen.—Phar. Centralhalle, xxvii, 74; Amer. Jour. Phar., April 1886, 167.

Benzol-Magnesia—A New Detergent.—To remove grease spots from fabrics, benzol-magnesia (prepared by rubbing calcined magnesia with benzol) is recommended. Old spots must be rubbed several times with the mixture before the spots disappear.—Phar. Zeitschrift für Russland, xxv, 123.

Chrome-Gelatin.—Used for rendering corks ether-tight. (See *Corks*, under "Pharmacy.")

Salicylated Gelatin—Formula.—Dr. Schwimmer recommends salicylated gelatin, prepared by the following formula, in vesicular eczema: Salicylic acid, 10; glycerin, 10; gelatin, 30; water, 30. Dissolve by the aid of heat.—Amer. Jour. Phar., June 1886, 296; from Wien. Med. Presse.

Casein Cement—Preparation.—Mr. Kayser recommends this cement as cheap and excellent as to its adhesiveness, especially in cases where gum arabic cannot be replaced by dextrin. Heat milk, precipitate with tartaric acid, collect the precipitate and dissolve while moist in a watery solution of 6 per cent. borax. An excellent *cement for china* is obtained by dissolving three parts of freshly precipitated casein in one part of silicate of sodium.—Amer. Jour. Phar., Aug. 1885, 382; from Mitth. d. Bayer. Gewist., through Rundschau Leitm.

Mucilage of Acacia—Preservation.—Mr. T. W. Watkins states that a mucilage of acacia, which will not spoil, may be made as follows:

Oil of Gaultheria	℥xv.
Calcium Phosphate	sufficient.
Water	℥ viij.
Acacia	℥ iv.

Triturate the oil of gaultheria with about one drachm of the phosphate of calcium and afterwards the water, and filter. Then use the filtrate to make a mucilage with the acacia.—Amer. Drugg., Jan. 1884, 4.

Mucilage—Preparation Suitable for Mineralogical Specimens.—Dissolve 1 p. gum arabic in water, add 4 p. sugar and 1 p. starch, and boil.—Amer. Jour. Pharm., Sept. 1885, 437.

Mucilage—Excellent Formula.—To 250 gm. of a concentrated solution of acacia (2 p. in 5 p. water) add a solution of 2 gm. of crystallized sulphate of aluminium in 20 gm. of water. Alum in place of the salt mentioned may be used, but gives less satisfaction. For decolorizing mucilage, freshly precipitated hydrate of aluminium is recommended. The ordinary mucilages, particularly if very concentrated, often fail in their object by merely wetting without causing to adhere, pasteboard to pasteboard, wood to wood, or a metal surface, and without cementing glass, china, pottery, etc. The addition of aluminium sulphate is recommended as sufficient to impart to a concentrated mucilage the desirable adhesiveness. Mucilage intended for pharmaceutical purposes should not be clarified as stated above, since in mixtures a reaction with aluminium may take place.—Amer. Jour. Pharm., Aug. 1885, 382.

Elastic Mucilage.—According to "Wien. ill. Gew. Ztg.," this is obtained in the following way: Dissolve 93 parts of acacia in sufficient water to obtain a liquid of syrupy consistency. Dissolve 1 part of salicylic acid in 20 parts of alcohol; add 3 parts of glycerin, and, lastly, 3 parts of green

soap, and mix. This solution keeps well, and besides being very elastic possesses considerable adhesiveness.—*Erfind. u. Erfahr.*, No. 9, 1885.

Label Varnish—Formula.—Mr. E. Dieterich communicates the following formula and method for making and using a label varnish:

Sandarac	150 parts.
Mastic	50 “
Venice turpentine	15 “
Alcohol	800 “

Macerate, with repeated stirring, until solution is effected. Then filter, and add enough alcohol to make 1,000 parts.

Paper labels are first sized with diluted mucilage, then dried, and then coated with this varnish. If the labels have been written with water-soluble inks or color, they are first coated with two coats of collodion, and then varnished.—*Pharm. Centralh.* 1885, No. 41.

India-Rubber Varnish—Preparation from Vulcanized Rubber.—According to “*La Nature*,” the scraps of vulcanized rubber, which is a mixture of rubber and sulphur, and which dealers in hard rubber goods can deliver in abundance, can furnish, by doing as follows, an excellent varnish, which dries promptly. Its color can be varied from a golden-yellow to the deepest brown. It sticks very well to metals, and can be employed on electric apparatus. These clippings are put into a deep earthen pot, covered with a tight lid. The pot is set upon hot coals. At the end of five minutes, take the pot off from the fire, and see if the material is melted. While the pot is on the fire, take care not to lift the lid up, because the vapors which would be thrown off take fire easily. After the rubber is all melted, so that it can be poured out, and there are no more whole pieces which can be discovered by fumbling through the mass with a large file, pour it into a flat tin basin. This basin should be rubbed with grease beforehand, and, after the mass is cooled, it is readily detached. Then break it into pieces, put it into a large bottle, pour on some benzol and rectified oil of turpentine, and shake the mixture up several times. The solution being complete, pour out the liquor to get rid of the impurities, some hardened rubber, which remains at the bottom, and a very limpid, beautiful, and excellent varnish is obtained.

Solutions of Shellac—Clarification.—According to “*Pharm. Rundschau*” (xii. 192) shellac solutions may be clarified by mixing with $\frac{1}{4}$ volume of benzin, and allowing to stand one hour, agitating occasionally. The mixture separates in two layers; the benzin layer is decanted and the shellac solution slightly warmed to free it from the odor of benzin. By treating the coarsely powdered shellac with ether before dissolving in alcohol, the operation is facilitated.

Bengal Lights—Improved Formula.—Mr. Thoerner has published some interesting information, the results of careful study, respecting

colored lights. He insists that only perfectly pure chemicals should be employed, especially when potassium chlorate is one of the constituents. Friction, shock, and heating increase the danger. The point of inflammation generally changes in time, and becomes lower, so that the danger increases, with age. The addition of lycopodium does not in any way diminish the danger, as has been stated by some.

White.—I. Potassium nitrate, 24; washed flowers of sulphur, 7; arsenious sulphide, 2. II. Potassium nitrate, 4; flowers of sulphur, 2; antimonious sulphide, 1. III. Potassium nitrate, 16; sublimed sulphur, 8; flour, 3. IV. Potassium nitrate, 36; sublimed sulphur, 7; antimony, 12. V. Potassium nitrate, 8; antimonious sulphide, 1.5; washed flowers of sulphur, 2.5. VI. Potassium nitrate, 12; washed flowers of sulphur, 3; antimony, 2. *White* (theatre fire, poured out loose).—I. Potassium nitrate, 72; sublimed sulphur, 12; antimonious sulphide, 12; arsenic disulphide, 8; shellac, 1. II. Potassium nitrate, 32; sublimed sulphur, 8; antimonious sulphide, 12; red lead, 11.

Yellow.—I. Sodium nitrate, 24; arsenious sulphide, 2; sulphur, 7; antimony (crude), 2. II. Potassium nitrate, 16; sulphur, 4; flour, 16; amber, 4; pine resin, 3; pitch, 4. III. Sodium nitrate, 6; sulphur, 1; soot, 1.

Blue.—I. Potassium nitrate, 16; antimony (crude), 8; zinc, 7. II. Ammoniacal copper sulphate, 2; potassium chlorate, 4; sulphur, 1. III. Potassium chlorate, 3; mountain blue, 1; sulphur, 1.

Violet.—Potassium chlorate, 49; sulphur, 25; precipitated calcium carbonate, 20; black oxide of copper, 6.

Red.—I. Potassium chlorate, 5; strontium nitrate, 16; arsenious sulphide, 1; sulphur, 2; soot, 1. II. Potassium nitrate, 5; sulphur, 2; antimony (regul.), 1. III. Strontium nitrate, 20; potassium chlorate, 2; sulphur, 5; antimony (crude), 0.5; charcoal, 2. IV. Strontium nitrate, 48; flowers of sulphur (washed), 9; pulverized charcoal, 2; potassium chlorate, 8. V. Strontium nitrate, 5; washed flowers of sulphur, 15; charcoal, 0.5; potassium chlorate, 6.5. Amer. Drugg., Nov. 1885, 215.

MATERIA MEDICA.

A. VEGETABLE DRUGS.

GENERAL SUBJECTS.

Vegetable Drugs—Methods of Storing and Preserving.—The following interesting observations respecting the storage and preservation of dried vegetable drugs are made in the "Monthly Magazine:" The two main

points to be observed in storing dried vegetable drugs are—first, that they are not kept in hermetically sealed vessels and so deprived of free access of air; and secondly, that they are kept the year through in as equable a temperature as possible. Every well-appointed pharmacy should contain a set of shelves remote alike from hot gas at night and from external changes of temperature. The shelves should be adjusted so as to contain a set of tins with lift-off lids, like biscuit boxes, which boxes will answer the purpose. The tins on each shelf should reach to within an inch of the shelf above. From the edges of the shelves should depend a strip of leather, as in book-shelves, hanging just below the top edges of the tins on shelf below, and keeping the dust from their lids. The tops of the tins should have some fifty or sixty apertures perforated all over them. These perforations may be readily made by giving the lid a smart blow with a stout, sharp brad-awl, firmly held in the hand. This set of tins on shelves is far preferable to either drawers, parcels, or wooden boxes. Drawers, unless constantly used, have a habit of accumulating dust and cobwebs inside them to an alarming extent. Mites also often infest one drug from another throughout a whole range of drawers. Drugs also contaminate each other when of powerful odor. They are also liable to be strongly impregnated with the tenacious odor of deal or cedar from the drawers themselves. The same objections apply more or less to the storage of drugs in boxes. Paper parcels do not even give the protection of a wooden receptacle, and are also horribly dirty, it being almost impossible to keep them free from large accumulations of dust. Another objection to them is the difficulty of affixing, and keeping plainly visible, labels which can be read at a glance.

Preservation of Plants—Novel Process.—Mr. Levallois has made the observation that when terrestrial plants are immersed in certain aqueous saline solutions a process of exosmose is set up, by which the vegetable tissue loses water and undergoes a change analogous to drying. He thinks that possibly this observation may prove capable of industrial application. Thus, a branch of an orange tree placed in a concentrated solution of chloride of calcium had at the end of two days considerably diminished in volume in all parts,—twigs, leaves and flowers; it had also become rigid and bitter, presenting the consistence of dried matter, and had decreased in weight from 25 grams to 10 grams. Nevertheless it still gave off the odor of neroli; a distillatory operation showed that there had been no loss of essential oil. The experiment was repeated upon leaf-bearing peppermint stalks, pelargonium leaves and orange leaves, in each case with similar results. All flowers do not, however, undergo desiccation uniformly like orange-flowers; for rose, jasmine and tuberose petals are only desiccated at certain points, either because their surface is protected in some way from contact with solution of chloride, or from the nature of cellular membrane. It was found that desiccation was effected more

rapidly in proportion as the solution was more concentrated, and that chloride of magnesium acted similarly to, but less energetically than a solution of chloride of calcium. If, however, the immersions were prolonged beyond a certain period, it was found that the materials not only ceased to lose weight, but began to recover their density, and that this then kept on increasing until they were much heavier than before.—Phar. Jour. and Trans., Dec. 26, 1885, 541; Compt. Rend. ci, 1175.

Succulent Plants—Preservation.—Mr. P. Hennings states that during the last three years, certain fruits, flowers and other portions of plants are preserved in the botanical museum of the University of Berlin by means of a solution composed of 4 parts of water and 1 part of alcohol saturated with salicylic acid. This method was recommended to the director of the museum, Prof. Eichler, by Prof. Pfeffer. Plain alcohol used to be employed formerly. It has been ascertained that plants which had lain for some time, yes, even for a long time, in the above-named mixture, are found when taken out to dry quite rapidly, and did not lose their natural appearance, while if they had been dried, they would have turned more or less black. Many succulent plants (from the orders Begoniaceæ Crassulaceæ, Euphorbiaceæ, Cactaceæ, etc.) have been beautifully preserved by this method. It is especially useful in such plants as are very juicy or contain a viscid mucilage, or have a thick epidermis, and are therefore difficult to dry. It is also very advantageous in the case of those which contain a dark coloring matter—such as many Aroideæ, Orchideæ, Rubiaceæ, etc.—which makes its appearance when the plant dries.—Verhandl. d. Botan. Ver. d. Provinz Brandenburg, xxv, 219; Amer. Drugg., Aug., 1885, 146.

Vegetable Products—Account of the Exhibits from Different States and Nations at the World's Exposition in New Orleans, during the year 1884–1885.—Prof. Carl Mohr has contributed to "Pharm. Rundschau" a highly interesting series of papers on the vegetable products that are of interest either in their medicinal or technical application, exhibited at the New Orleans Exposition, 1884–1885. It is impracticable to abstract this important contribution for this report, and reference must therefore be had to the original papers in the journal above named, there being a contribution each month from March to October, 1885.

Drugs Gathered in Pennsylvania.—Mr. Geo. W. Stoeckel has contributed an interesting paper on "Indigenous Materia Medica," in which he gives a list of the drugs that are gathered in Pennsylvania, their localities and quantities. While the author does not claim that his list is complete, his paper will prove a valuable contribution to the history of drugs, and will be profitably referred to in Proc. Penn. Pharm. Assoc., 1886, 140–148.

Plants used in medicine in Manchuria.—In a recent report, Dr. Morri-

son, acting medical officer to the British Consulate at Newchuang, appends some remarks upon the botany of South Manchuria, and enumerates the following plants used medicinally:

Clematis tubulosa.—The stems are reported to possess anthelmintic, cholagogue and stimulant tonic properties.

Aconitum Anthora, *A. barbatum*, *A. Fischeri*.—Roots of these three species are used in medicine, stimulant, diuretic and alterative properties being attributed to them.

Thalictrum rubellum, *Cimicifuga simplex*, *C. japonica*.—The roots of these three plants are reputed to have tonic properties, and useful in leucorrhœa, amenorrhœa, and prolapsus ani.

Pæonia albiflora.—Root used in blennorrhagia and diseases of women.

Pæonia rubra.—Bark reputed to be alterative and carminative.

Papaver somniferum.—Cultivated extensively throughout Manchuria for opium.

Althæa rosea.—Used medicinally, but cultivated chiefly for the dye extracted from the very dark colored petals.

Dictamnus Fraxinella.—Used for its aromatic and tonic properties.

Glycyrrhiza glabra, *G. echinata*.—The roots of both used on account of tonic, and alterative properties.

Caragana flava, *C. microphylla*.—Roots reputed to be tonic, emollient, restorative.

Pterocarpus flavus.—Useful in rheumatism; tonic, and diuretic.

Dolichos Soja (? *Soja hispida*).—The bean yields oil, bean cake, cattle food, etc.

Arachis hypogæa.—The ground-nut is cultivated near Liaoyang.

Prunus Cerasus.—The bitter kernels of the common wild cherry are used in dropsy, rheumatism and cardialgia.

Prunus species?—The fruit is used as a laxative.

Bupleurum octoradiatum.—Roots are reputed to be antiphlogistic, arthritic and derivative.

Libanotis sibirica.—Roots used in rheumatism, chills, catarrh, etc., as a diuretic and eliminative remedy.

Cicuta species?—Root used as a stimulant and anti-spasmodic.

Angelica species?—Used as a stomachic, tonic and carminative.

Panax Ginseng.—The favorite remedy of the Chinese in all forms of debility or severe disease. Properties, tonic, stimulant and carminative.

Aralia palmata (or *Acanthopanax spinosum*).—Bark used in rheumatism, etc.

Atractylis chinensis, *A. rubra*.—Roots used as a tonic, stimulant, diuretic, and in chronic dysentery.

Adenophora verticillata, *A. trachelioides*.—Roots are used on account of pectoral and emollient properties.

Plantago asiatica.—The seeds are diuretic, pectoral, tonic and anti-rheumatic.

Gentiana asclepiadea or *squarrosa*.—The roots are used in ophthalmia and hæmaturia as an antiphlogistic.

Sesamum indicum.—Medicinal properties are ascribed to the fruit and to the oil expressed from the seeds. Seeds used in confectionery.

Cuscuta monogyna, *C. europæa*.—The seeds of both are used as tonics and diaphoretics.

Lithospermum erythrorrhizon.—Root used in small-pox and anæmia.

Scutellaria viscidula.—Root used as an emollient, pectoral and anthelmintic.

Viscum articulatum.—Stems used in disorders during pregnancy and after confinement.

Heterotropa asaroides.—Used as an emetic, diaphoretic, diuretic and purgative, and in rheumatism and apoplexy.

Ricinus communis.—*Cultivated*.—The oil is used only in cooking by Chinese.

Ephedra vulgaris, *E. flava*.—Roots and stems of both used, derivative and sudorific properties being attributed to them.

Allium.—The ordinary species cultivated among the Chinese are the chive (*A. Schænoprasum*), shallot (*A. ascalonicum*), garlic (*A. sativum*), and onion (*A. Ceba*), together with other species. Various medicinal properties are ascribed by the Chinese to the different members of the group.

Equisetum ramosum.—Stems used as astringent and for inflamed eyes.

The medicinal plants noted are only such as are exported from the port of Newchuang, and in quantities sufficient to entitle them to separate classification. Pharm. Jour. and Trans., Sept. 26, 1885, 268.

ALGÆ.

Algæ.—Species used in the production of the different varieties of *Agar-Agar*, which see under "Organic Chemistry."

Seaweed—New Method of Treatment.—Prof. S. P. Sadtler draws attention to the new method of treating seaweed proposed by Mr. E. C. C. Stanford, whereby all the available constituents of the seaweed are utilized. Mr. Stanford first extracts from the *Laminaria* the potassium chloride ("muriates") potassium sulphate and "kelp-salt" (sodium chloride containing some carbonate and including the iodides), by simple maceration

in cold water. The amount so removed from the air-dried *Laminaria* is about one-third of its weight (thirty-three per cent.), of which twenty to twenty-two per cent. are mineral salts, and the balance consists of dextrin, mannite and extractive matter, leaving two-thirds of the plant (sixty-six per cent.) for further treatment apparently unaltered. This residue contains the peculiar new substance, *Algin*, and the cellulose.

In this new process, the sea-weed is to be exported and worked at a central factory, and all the common varieties can be used. The weed is first boiled with sodium carbonate, the solution is filtered and precipitated with sulphuric acid, the precipitate being the new substance, *algin*, which resembles albumen, and contains all the nitrogen, and moreover, all that is nutritious in the sea-weed. The solution is now neutralized with limestone, the sulphate of lime deposited, the neutral solution evaporated down, and the sulphate of soda crystallized out. The mother-liquid, containing all the potash salts and iodine, is carbonized, forming the "kelp-substitute." The residue on the filter is the cellulose. The whole plant is thus utilized as shown in the following table:

Soda Solution.

Residue.	Precipitated by sulphuric acid.	Retained in solution.	
Cellulose.	<i>Algin</i> .	Sulphate of soda, crystallizes out as Glauber's salt.	Mother-liquor, carbonized, is kelp-substitute.

A comparison is made of the old and wasteful "Kelp Process," the improved "Char Process," as proposed by Mr. Stanford (whereby all the iodine is utilized), and the above described "Wet Process," which proves to be the most economical of all.

Algin has fourteen times the viscosity of starch, and thirty-seven times that of gum-arabic. *Algin* or sodium alginate in solution is precipitated or coagulated by alcohol, acetone and collodion, but not by ether. It is precipitated by mineral acids, various salts, and by lime and baryta water. The solution is not precipitated or coagulated by alkalies and alkaline salts, starch, glycerol and cane-sugar. It does not precipitate the ordinary alkaloids. It is distinguished from albumen, which it most resembles, by not coagulating on heating, and from gelose by not gelatinizing on cooling, by containing nitrogen, by dissolving in weak alkaline solutions, and being insoluble in boiling water. From gelatin it is distinguished by giving no reaction with tannin; from starch, by giving no color with iodine; from dextrin, gum-arabic, tragacanth and pectin by its insolubility in dilute alcohol and dilute mineral acids.

It is remarkable that it precipitates the salts of the alkaline earths,

with the exception of magnesium, and also most of the metals; but it gives no precipitate with mercuric chloride or potassium silicate.

The various uses to which algin may be applied are also described. It is sufficient to state here that it is used for sizing fabrics, as a mordant in dyeing and printing, as food, and for boiler incrustation. It is useful also in pharmacy, as an emulsifying agent, excipient for pills, etc.—*Amer. Jour. Pharm.*, November 1885, 544-547.

Rhipilia Andersonii.—*A New Marine Alga*.—Mr. George Murray describes a new marine alga under the name of *Rhipilia Andersonii*. It grows on mud flats in King's Island Bay in the Mergui archipelago, has a broad shield-like fibrous frond which appears above the mud, with a stalk-like mass of rhizoids in the mud, and presents so much the general appearance of some sea anemone, that it was first sent to be named to the Zoölogical Department at the British Museum.—*Pharm. Jour. and Trans.*, April 3, 1886, 842.

FUNGI.

Ergot—Determination in Flour.—Prof. A. Hilger recommends the following method for determining the presence of ergot in flour: Ten grams of the flour are macerated, with frequent shaking during 1 day, with 20 grams of ether and 10 drops of diluted sulphuric acid (1:5). The liquid is filtered off, brought to 20 gram by washing the residue with ether, and then mixed with 10-15 drops of saturated aqueous solution of bicarbonate of sodium. After repeated shaking a violet color is assumed by the liquid if ergot is present in the flour.—*Arch. d. Pharm.*, Nov. 1885, 828-831.

Pressed Ergot—Stability.—Mr. John Moss has made some experiments in the way of expressing the fixed oil from ergot, as suggested by Mr. T. B. Grover, and finds that the ergot so treated is far less liable to attacks of insects, alteration by atmospheric influence, etc., than ergot not so treated. By strongly pressing ground ergot about 12½% of fixed oil was removed. A sample of pressed ergot had retained its potency after six and a half years.—*Yearbook of Pharm.*, 1885, 410-413.

Ergot of Diss—Source, Character, etc.—Mr. E. M. Holmes describes "ergot of diss," a specimen of which, attached to its fresh plant, has lately been presented to the Museum of the Pharm. Society of Great Britain by Prof. Léon Soubeiran. The ergot of diss derives its name from the seed on which it grows.

Ampelodesmos tenax, Link, which is called "diss" by the Arabs of Algeria. It was first detected in 1842 by Mr. Durieu de Maisonneuve, a member of the Scientific Commission to Algeria, and differs from ergot of rye in being barely half its diameter, but twice or thrice its length, varying, however, considerably in size. Like the ergot of rye, it is doubtless produced by the fungus known as *Claviceps purpurea*. The ergot of

diss when small is slightly curved, but when long (6-9 centimeters) it takes a spiral turn from right to left, the longitudinal furrows being present on the inner surface. It is collected in June, July and August, is drier and more brittle and less hygroscopic than rye ergot, and therefore keeps well in dry places. Preparations similar to those made from rye ergot have been made from the ergot of diss, which is said to be twice as strong as ergot of rye. This, together with its greater stability, as well as its cheapness, makes the ergot of diss worthy of the attention of the medical profession—Phar. Jour. and Trans., Feb. 13, 1886, 584-585.

Polyporus Senex—Use as a Styptic, etc.—Dr. Grossi has used this gigantic species of agaric, found on the coast of Chili, as a styptic and to arrest night-sweats. For the latter purpose, he combines $3\frac{1}{4}$ grains of the drug with 15 grains of sodium bicarbonate, 3 ounces of distilled water, and 75 grains of gum arabic, giving a tablespoonful at night.—Amer. Drugg., Aug. 1885, 155.

Saccharomyces ellipsoideus.—Influence in producing the peculiar flavor of *Grape Brandy*, which see under "Alcohols," etc.

Micrococcus prodigiosus.—Occurrence and character in *milk* which see under "Organic Chemistry."

Penicillium.—Occurrence in *Pharmaceutical Extracts* which see under "Pharmacy."

Rhodomyces—A New Human Vegetable Parasite.—Dr. R. von Wettstein describes a fungus found by him in the gastric juice of patients suffering from pyrosis, which he describes as a new species under the name of

Rhodomyces Kochii.—It was always observed outside the organism, but appears to be connected with the saliva, and was found only in certain individuals. It shows itself as a dense, delicate, pink mould, the structure of which is observed by the enormous quantities of conidia which it produces. Its morphological characters can therefore only be determined by culture. The author considers *Rhodomyces* to have the closest affinity with several forms of *Oidium*; but it is distinguished by the appearance of the conodiophores, by the mode of formation of the conidia, and especially by its unseptated hyphal branches. In habit it resembles *Trichothecium roseum* and several other moulds.—Pharm. Jour. and Trans., Jan. 23, 1886, 632.

Yellow Opium Mould—Botanical Relation.—Prof. Wm. Trelease examined the bright yellow fungus which is sometimes observed on opium. It is the *Eurotium herbariorum*, *Link*, and this was shown in 1854 by DeBarry to be the ascosporic fruit of one of the common green molds, *Aspergillus glaucus*, *Lk.* and has therefore been named *Erotium Aspergillus-glaucus Lk.* The paper is accompanied by drawings of the fruiting parts.—Contrib. Dep. Phar. Univ. Wisc., 1886, 4-9.

Amanita muscaria—Used by the Ancient Scandinavians.—Professor

Schübeler, in his "Flora of Norway," suggests that the celebrated "Berserkage," in which the ancient Scandinavians indulged was due to an intoxicating liquid prepared from the fly agaric. In the present day this liquid, called "Minhamá," into which the juice of *Epilobium angustifolium* also enters as an ingredient, appears to be used only by the nomadic Korjakes, with whom the neighboring Kamschatkan tribes carry on a profitable trade, giving only one or two of the fungi for a reindeer. The symptoms following its use are, according to the Kamschatkans, a trembling in the limbs, followed by great flushing of the face and general excitement and irritability, accompanied often by an abnormal increase of muscular force.—*Nature*, Dec. 31, 1886, 213.

Agaricus (Amanite) muscarius.—*Occurrence, Character, etc.*—In view of the attention that has been drawn by the above note to the fly agaric, Mr. R. Modlen makes some general remarks upon this fungus, a brief abstract of which will be interesting. It grows chiefly in woods and under trees, and is variable in color, being found scarlet, carmine, orange, greenish-yellow, pale-brown and even white in hue. The pileus, which is often seven or eight inches in diameter, is covered with whitish angular warts or spongy scales, which when moist are viscid. It is convex when growing, but becomes flat or depressed when it has attained its full size; the stem is not so solid as that of the mushroom and is bulbous below, and covered at the base with scales. The gills are white and broad. The action of this fungus is upon most persons that of a narcotic, resembling opium in its immediate effects. It was formerly administered in cases of epilepsy, but it is a most dangerous medicine; though it is stated that under certain conditions it becomes inert. Thus in some parts of Russia it is said to be eaten with impunity when steeped in vinegar. It is said also to become, at least partially, innocuous by heat, the poisonous principle being removed or destroyed. According to Langsdorff these fungi are collected during hot weather, and dried on strings or picked up already dried on the ground, in which case they are more narcotic than when artificially dried. The fungus appears to be more virulent in Europe, especially in England, than elsewhere.—*Pharm. Jour. and Trans.*, February 27, 1886, 731.

Cantharellus cibarius, L.—*Characters that distinguish the Innocuous Fungus from the poisonous Cantharellus aurantiacus*, Fries.—Dr. Emil Pfeiffer draws attention to the fact that at a certain period of its development the poisonous fungus, *Cantharellus aurantiacus*, Fries, is liable to be mistaken and collected for the innocuous species, *C. cibarius*, L. and that such a case has occurred during the month of October, 1885. The circumstance that a good description of the two species is not generally accessible, has induced him to communicate an excellent description of the same, side by side, in *Arc. d. Pharm.*, Nov. (2) 1885, 885-888.

Edible Fungi—Poisonous Effects under Certain Conditions.—Mr. W. G. Smith records that after partaking of a generally harmless species of fungus,

Clitocybe dealbatus, he was attacked with a fit of such excessive perspiration that in twenty minutes after swallowing the fungus his clothes were soaked as much as if he had been exposed to a storm of rain. Another person who partook of the fungus at the same time was unaffected.—Pharm. Jour. and Trans., May 29, 1886, 1009; Gard. Chron., May 1, 1886, 556.

LICHENES.

Carrageen—Bleaching by chemical agents.—The unsatisfactory experiences with different parcels of "carrageen album," which became discolored in drying and gave evidence of the presence of free sulphurous acid, led Mr. Schack to investigate the subject. After considerable trouble he obtained the information that it is a practice to bleach this moss in a manner similar to that adopted for sponge. It is first steeped in cold water, then pressed and afterwards placed in a weak solution of permanganate of potassium. After removal from this bath, the moss is washed with cold water, then dipped in a weak solution of hyposulphite of sodium, and again washed in water. Pharm. Jour. and Trans., Feb. 27, 1886, 723; Pharm. Ztg., Feb. 6, 1886, 87.

LYCOPODIACEÆ.

Lycopodium—Size of the Spores.—Mr. D. H. Galloway has made some calculations respecting the size of the spores of *Lycopodium*. From careful measurements of 50 spores he found the average diameter to be $\frac{1}{1000000}$ of an inch, and he calculates that it would take 857 of them to make an inch in length, and that a cubic inch would contain 629,422,793 grains.—Pharm. Jour. and Trans., Oct. 31, 1885, 370; Jour. Mier. Soc., 1885, 825.

Lycopodium Saussurus—Occurrence of an Alkaloidal Constituent.—Mr. Adrian has obtained an alkaloid from this plant—known in Brazil under the name of "piligan," and closely allied to the European species: *L. Selago*. He obtained the alkaloid, which he has named

Piliganine, by exhausting the powdered plant with boiling water, evaporating the liquid to a soft extract, exhausting the extract with alcohol, precipitating with acetate of lead, and removing excess of lead. The clear filtrate is then neutralized with tartaric acid, which is added in slight excess, and again filtered. The filtrate is distilled, resin precipitated by the addition of water, the resin removed by filtration, the aqueous liquid treated with carbonate of sodium, and shaken in the chloroform, which removes impure piliganine. When purified by resolution and reprecipitation the alkaloid forms a soft mass of a light yellow

color and transparent, and has a strong odor recalling that of pelletierine. It has an alkaline reaction, and emits white vapors in the presence of hydrochloric acid gas. It is soluble in water, alcohol and chloroform, but little soluble in ether. The hydrochlorate is deliquescent. The action on animals is that of a powerful emetic and cathartic.—Phar. Jour. and Trans., June 26, 1886, 1086; Compt. Rend., June 7, 1886.

FILICES.

Male Fern—Chemical Investigation.—Mr. G. Dacomo has subjected the rhizome of *Aspidium Filix-mas* to chemical study, limiting himself, for the present, to the consideration of the chemical nature of the ethereal extract. Thirty kilograms of material were exhausted with ethylic ether, in a percolator, and after spontaneous evaporation, left 1,750 grams of ethereal extractive. This extract, after treatment with a mixture of alcohol and ether, left as a remainder a brown pulverulent residue of 70 grams in weight. The insoluble residue so obtained was agitated with a solution of caustic potash (1-100), and from the filtered liquid, on the addition of acetic acid, gave a voluminous precipitate of filicic acid (filicin of Trommsdorff). The portion that was not dissolved by the potassa, and that remained upon the filter, was then exhausted with boiling alcohol, which deposited, on cooling, a white, flocculent material, wax-like in appearance, that after repeated crystallizations from alcohol, was used for the ultimate analysis. The figures he obtained for his analyses led to the formula $(C_{13}H_{26}O)_x$, and were as follows:

	I.	II.
C. per 100	78.99	78.80
H. "	12.98	13.28
O. (by difference)	8.03	7.92
	100.00	100.00

This substance is insoluble in water, very little soluble in ether or in cold alcohol. It is not saponified on prolonged ebullition with caustic potassa in concentrated alcoholic solution. The residue, left on the filter, after the boiling alcohol treatment, was merely extractive. The more soluble portion of the ethereal extract, that is, that dissolved in the mixture of alcohol and ether was, after reduction to extractive consistency, exhausted first with cold water. This aqueous solution, treated with acetate of lead to precipitate the tannin (filitannic acid?), washed and subjected to a current of hydrogen sulphide to remove excess of lead, left a saccharine residue. The residue from the aqueous exhaustion was then treated with alcohol at 85° C., which evaporated, left as residue, a large quantity of a black extractive, soluble in caustic potash. The small residue left consisted of a wax-like fatty material soluble in alcohol, especially in the cold. From the alcoholic treatment, there did not remain as resi-

due more than a small quantity of green fixed oil.—*Annali di Chim. Med. Farm.*, Jan. 1886, 19.

AROIDEÆ.

Acorus Calamus.—*Proximate Examination*.—Mr. H. Thoms has subjected the rhizomes of *acorus calamus* to proximate examination and has succeeded in isolating a bitter principle to which he has given the name

Acorin, and which appears to be present to the amount of 0.1854 per cent. It is a clear, thick, honey-yellow liquid, having a neutral reaction, a faint aromatic odor, and a very bitter aromatic taste. Its composition is represented by the formula $C_{36}H_{60}O_6$, and it is a glucoside which by the action of dilute acids or alkalis in a current of hydrogen is split into volatile oil of calamus and sugar. It is insoluble in water, in dilute acids and dilute alkalis, but is easily soluble in absolute alcohol, in methylic alcohol, chloroform, etc. If acids or alkalis react upon it in contact with atmospheric air, the oil produced readily oxidizes and is converted into

Acoretin, the neutral resin occurring in the rhizome. By reduction from alkaline solution by nascent hydrogen, acoretin gives volatile oil and sugar as final products. The author has also isolated from the extract remaining after the removal of the *acorin*, a small quantity of a strongly basic substance, which he has named

Calamine.—The new alkaloid is crystalline, soluble in alcohol, in chloroform, and in acetone. It is insoluble in water and in ether. *Arch. d. Pharm.*, June (2) 1886, 465-481.

GRAMINACEÆ.

Wheat.—*Variations in the Chemical Composition of the Grain*.—Mr. Clifford Richardson communicates the results of a series of experiments made with a view to determine the influence of soil and climate on the nutritive properties of wheat, the experiments encompassing four hundred and seven analyses. As a general result it may be stated that American wheats are lighter than those of other countries, and contain a smaller proportion of albuminoids, water, and vegetable fibre, about the same amount of ash, and more oil. The highest proportion of albuminoids in American grain was found in a spring wheat from Dakota, viz., 18.03%, while Russian wheats contain as a maximum 24.56%, and an average of 19.48%. The variations in the composition of the different kinds are very large. Between the maximum and minimum the differences amounted in water to 4.82%, in ash to 2.77%, in oil to 2.53%, in carbohydrate to 13.82%, in fibre to 2.61%, and in albuminoids to 10.33%. The wheats of the East are very poor in ash and albuminoids, and the size of the grain is small; in advancing from east to west a gradual improvement was observed in these respects. Spring wheats contain more albuminoids than winter

wheats ; winter wheats contain, on the other hand, more starch. The action of climate is similar, a warm and dry season shortening the period of growth, diminishing the percentage of starch and the amount of cellulose, and increasing that of albuminoids, the size of the grain being decreased. Something also depends on the nature of the soil ; the exhausted soil of the Eastern States is not able to produce so large an amount of albuminoids and of ash as the richer soils of the West.

With regard to *maize* the results are the same in the main features.—Pharm. Jour. and Trans., July 18, 1885, 70 ; Amer. Chem. Jour.

Wheat—Nutritive Value of Different Parts of the Grain.—Mr. Aimé Girard has contributed an exhaustive treatise on the nutritious value of the different parts of the grain of wheat. He treats the grain of wheat as consisting of three parts : (1) The integument, including not only the pericarp, but also the outer envelopes of the endosperm or albumen ; (2) the embryo, separated from the endosperm ; and (3) the mealy endosperm freed from its outer envelopes. He discusses these three constituents in detail, from the points of view of their anatomical and chemical composition, the part taken by each in the composition of bread, and their properties in relation to digestion ; the general result being that the endosperm is the only part of the grain which is of value for nutritive purposes without a compensating drawback, the integuments and embryo being either useless or actually injurious. The object, therefore, to which millers should especially direct their attention, is the discovery of mechanical means by which the integuments and the embryo may be removed from the grain, reserving the mealy endosperm alone for the production of flour. Annal. de Chim. et de Phys., 1885 ; Phar. Jour. and Trans., August 1885, 114.

Flour—Production of a Poisonous Alkaloid by Age.—Mr. Ballaud has detected a poisonous alkaloid in flour which had been kept in sacks for twelve to eighteen months. It was obtained by exhausting the flour without drying it in a displacement apparatus by means of ether, distilling the ether-tincture to dryness, and treating the dry residue with a small quantity of warm water, in which, upon cooling, the alkaloid was readily detected by the usual reagents. The presence of the alkaloid in flour which had been kept for three years was very marked, and flour made into pellets with the aqueous extract obtained as above and administered to sparrows proved fatal to them in a few hours.—Phar. Jour. and Trans., Oct. 31, 1885, 368 ; Jour. de Phar., 1885, 341.

Maize—Separation of Fixed Oil.—Indian corn contains about 10 per cent. of nitrogenous principles and 7 per cent., or in some varieties 9.5 per cent. of fat. The presence of the latter interferes with many of the uses for which corn is otherwise adapted, but the ripe fruit cannot be deprived of the oil by pressure. After the grain has been malted, the light germ may be separated by careful crushing and winnowing, and

yields by pressure about 15 per cent. of oil, and a press cake, rich in albuminoids and retaining 4 or 5 per cent. of oil. In the manufacture of starch the ground mixture of corn and water, on standing, deposits the starch and leaves a milky liquid, which readily undergoes putrefaction. This liquid is an emulsion of oil of maize in the dissolved albuminoids, and may be utilized for the production of both substances. The separation may be accomplished according to a patent granted March 10, 1885, to Dr. F. V. Greene, by precipitation by heat or by diluted mineral acids or various salts, notably by aluminum sulphate. According to the manipulation the oil may be recovered by filtration, by pressure, or by a solvent, the remaining albuminoids being valuable for manure or for other purposes.

Oil of Maize has been used to some extent as a lubricator and for soap-making. It is of a yellowish or bright yellow color, bland, rather thick, has the specific gravity 0.92 and at -10°C . (14°F .) congeals to a white mass. The oil is colored transiently dark green by sulphuric acid, and by nitric acid it is converted into a somewhat soft yellow mass.—*Amer. Jour. Pharm.*, Aug. 1885, 403.

Avena sativa—Preparation of Tincture, which see under "Pharmacy."

Powdered Rice—*Value as a styptic*.—According to the "Indian Medical Gazette," powdered rice is stated to have marked hæmostatic properties. Mixed with lint, in the proportion of from 4 to 11 per cent., the lint thus treated being used as a compress, it is more effectual than oxide of zinc, subnitrate of bismuth, salicylic acid, or carbolic acid.—*N. Y. Med. Jour.*, Jan. 16, 1886.

Malt—*Preparation in Japan for making a Malt Extract*—*Midzu-ame*—which see under "Pharmacy."

PALMACEÆ.

Betel-Nut—*Isolation of a Volatile Alkaloid*.—Mr. E. Bombalon has succeeded in isolating from the betel-nut a volatile alkaloid, resembling nicotine, which he has named

Arekane.—It is left from an ethereal solution in form of a colorless oil, smelling like weak meat broth, and having a strong alkaline reaction. With tartaric, citric, hydriodic and salicylic acids, it forms varnish-like salts, the salicylate having a tobacco-like odor. The taste of the alkaloid as well as of its salts is at first imperceptible, but afterwards becomes acrid. It increases the secretion of saliva, slackens the pulse, and has a purgative action.—*Phar. Jour. and Trans.*, April 3, 1886, 838.

ANTHERICEÆ.

Xanthorrhœa—*Products*.—Baron Ferd. von Mueller gives an account of the geographical distribution in Australia and Tasmania of the differ-

ent species of this genus and of their resinous products, which of late years have been extensively exported by Messrs. William Somerville and Henry Wilks, who prefer the resin of *X. hastilis*, *X. quadrangulata* and *X. Tateana* for various reasons; *X. Preissii* yields one of the best resins, and is widely distributed in Western Australia. The resin of *X. hastilis* is known as gum acroides, is yellow and lighter colored than the other kinds, usually more sticky, and less inclined to become pulverulent; it is rather fragrant, but less so than the resin of *X. quadrangulata*. A comestible gum somewhat resembling tragacanth is sometimes deposited in the trunk in vertical concentric layers. 300 tons of the resins of *X. hastilis* have been exported in one year, and at one time the price rose to £65 per ton for the best quality, but for ordinary quality is from £7-10. One trunk yields on an average 5 pounds of resin which exudes from the persistent rudiments of the leaf bases, the exudation being sometimes increased by bush fires.

The resin of *X. Tateana* is dark reddish-brown, like the resin of *X. australis*, but drier; a trunk yields about 20 pounds, and during the collection of the resin is destroyed; the value is about £25 per ton.

The author has sometimes seen masses of resin weighing 50 pounds at the base of the trunk of *X. australis*, most probably the produce of several years melted together by repeated fires. *X. semiplana* is stemless and produces little resin. *X. minor* is matted, the tufts of leaves being approximate and radical. In wet soil *X. Preissii* remains stemless.

The resin of *X. quadrangulata* is dark, glossy and of an agreeable odor resembling that of honey and benzoin; on exposure it becomes somewhat powdery, but is also found as small globular masses at the base of the trunk. *X. arborea* has the persistent bases of the leaves of previous years very short, and the resin is rather difficult to collect; the yield of a trunk is about 3 pounds, and the resin is almost ruby colored.—Amer. Jour. Pharm., August 1885, 405; from Zeitschr. (Esterr. Apoth. Ver., 1885, 293.

ASPARAGINACEÆ.

Asparagus—*Presence of Vanillin and Coniferin*.—The observation that asparagus, especially in the preserved condition, sometimes leaves an after-taste resembling vanillin, induced Mr. Lippmann to endeavor to ascertain whether this was due to the presence of some allied aromatic compound. He accordingly examined the juice and cellular tissue of the asparagus in the manner adopted for the separation of vanillin from beet root, and obtained some vanillin and a considerable quantity of coniferin, both of them possessing the ordinary chemical and physical properties of these compounds.—Pharm. Jour. and Trans., January 30, 1886, 644; Ber. d. D. Chem. Ges., xviii. 3335.

LILIACEÆ.

Phormium tenax, *Forster*—*Medicinal Uses*.—This plant yields the so-

called New-Zealand hemp, and is also regarded as a good substitute for sarsaparilla. Dr. F. A. Monckton, in the *Lancet*, reports it to be very useful for producing healthy granulations in cases of severe lacerations and amputation. A strong decoction is used, made by boiling the roots and the butts of the leaves for twelve hours, and to prevent fermentation, which readily sets in, half an ounce each of carbolic acid and of glycerin is added to a quart of the decoction.—*Amer. Jour. Phar.*, June 1886, 302.

Aloes—Prevention of Dust in Powdering.—It is stated in "Pharm. Post," that the addition of about one drop of oil to every ten grams of aloes will be found to prevent the rise of the very annoying bitter dust as well as the caking of the drug when reducing it to powder.

DIOSCOREACEÆ.

Dioscorea villosa, L.—*Microscopy of the Rhizome.*—Prof. E. S. Bastin contributes an excellent description of the microscopic character of rhizome of *Dioscorea villosa*, L., accompanied by suitable illustrations, for which see *The Western Drugg.*, Aug. 15, 1885, 203-204.

IRIDEACEÆ.

Saffron—Cultivation in the Apennines.—Mr. C. A. Ulrichs communicates some interesting information respecting the cultivation of saffron in the Apennines. The bulbs, which are left in the ground during the winter without any special protection, are removed in August, cleansed, and, the ground having been manured slightly, they are again planted, usually in the beginning of September, in rows one bulb against the other. In four weeks from the time of planting the flowers begin to bloom, and the collection of flowers goes on daily, the pistils being usually removed at home on the same day and dried on a sieve over a coal fire. The product of 17 to 33 bulbs is required to make 1 gram of saffron, or 25 on an average, and these require about 2 square feet of ground. One gram of dry saffron contains about 100 pistils. The flowers themselves find no manner of application. As regards the removal of the bulb from the ground and replanting, it is a practice that is uniformly observed, and it appears to have for its purpose the removal of outer epidermis—thereby preventing decay—and of the young bulbs from the parent bulb, thereby preventing too close contact of the growing plants.—*Arch. d. Pharm.*, Aug. 2, 1885, 622-625.

AMOMEACEÆ.

Ammonum Melegueta, Roscoe—*Proximate Examination.*—The seeds, known as "grains of paradise," were examined by Mr. Fred. Schwarz. The powder thoroughly dried by heat lost 18 per cent. of moisture and volatile oil, and on incineration gave nine per cent. of gray ash. Treatment with cold water furnished a light brown infusion, containing albumen, gummy matter and a little tannin. Benzin now exhausted 5 per cent.

of a reddish-brown oily matter, having a slight aromatic odor and a burning taste, and soluble in carbon bisulphide and in ether; on redissolving it in little benzin, the addition of alcohol precipitated a white fat. The powder now yielded to alcohol a reddish-brown acrid resin, which is soluble in ether, but insoluble in carbon bisulphide. Neither bisulphide of carbon nor ether took up any compound from the powder exhausted as above; but treatment with boiling water furnished an amylaceous jelly.—*Amer. Jour. Pharm.*, March 1886, 118; from the author's thesis.

Cardamoms—Cultivation.—The cultivation of cardamoms appears to be successfully carried on by colonial planters. There has recently been offered in the London market a very small variety, the fruits of which are not much larger than an ordinary pea, but which are full of seeds of good aroma and quality.—*Pharm. Jour. and Trans.*, Aug. 1, 1885, 107.

ORCHIDEACEÆ.

Cypripedium pubescens—Proximate Analysis of the Rhizome.—Mr. Volney C. Dagget, after a preliminary account of the botany, history and other known facts relating to the officinal rhizome of *Cypripedium pubescens*, the author gives a detailed description of his method of analysis and of the results he obtained. The constituents established to be present are the following: Traces of volatile oil, fixed oil, two resins, volatile acid, tannin, gallic acid, gum, sugar, starch, chloride of sodium, magnesium salts, lignin, and a bitter principle, probably a glucoside. *Amer. Drugg.*, July 1885, 129-131; from the author's thesis.

Tsuchiakabi—A Japanese Diuretic Drug.—The "Lancet" draws attention to a Japanese drug, called "tsuchiakabi," which is the dried fruit of an orchid indigenous to Japan. It yields its properties to water, to which it communicates an acid and bitter taste. The medicinal properties are considered to be due to a resin acid and glucoside. The Japanese employ a watery extract of the fruit for diseases of the urinary passages and bladder, in cases in which cubeb and copaiba would be prescribed in this country. Over these medicaments it has the advantage of being free from disagreeable odor.—*Amer. Drugg.*, May 1886, 86.

ARISTOLOCHACEÆ.

Aristolochia fetida—Analysis of the Root.—Messrs. Henry Trimble and Samuel S. Jones have analyzed the root of *Aristolochia fetida*, which plant is commonly known in Texas under the name of

Yerba del Indio.—As obtained by the author from Mr. H. I. Schuchard, of San Antonio, Texas, the root consists of globular pieces much resembling jalap in size and appearance; externally almost black, and internally, when dry, reddish brown. It possesses a slightly astringent taste and a strong narcotic odor. The loss on drying amounted to 14.10

per cent., and the ash to 4.88 per cent.; the latter was found to be composed of the usual constituents.

The following is a summary of the constituents found:—

Moisture	14.10 per cent.
Ash	4.88 “
Fixed oil	1.95 “
Resin	.50 “
Soluble in absolute alcohol : tannin, coloring matter . . .	7.64 “
Soluble in water : mucilage, tannin and coloring matter .	10.24 “
Albuminoids	1.90 “
Soluble in dilute hydrochloric acid	4.11 “
Lignin	52.68 “
	98.00

—Amer. Jour. Pharm., March 1886, 113-114.

Yerba and Raiz del Indio—*Application of Name to Different Plants.*

—Prof. J. M. Maisch, referring to the foregoing paper, draws attention to the fact that in the winter of 1874-1875 Mr. R. F. G. Voelcker made a chemical examination of

Raiz del Indio—(See Proceedings 1876, 131.) A comparison of the roots examined by Messrs. Trimble and Jones with those examined by Mr. Voelcker inclines the author to the belief that while the latter roots were somewhat larger, the two drugs were nevertheless identical. Mr. Voelcker's roots were, however, not obtained from an *Aristolochia*, for on the fresh roots being planted, they produced leaves which, together with the chemical character of the root, led the author to infer that the plant belongs to the natural order of Polygonaceæ. The roots of Mr. Voelcker, moreover, appear to be identical with a root described in the “Report of the Commissioner of Agriculture for the year 1879” by the name

Cañaigre, and which is the bulbous root of a kind of dock specifically called *Rumex hymenosepalum* (Torrey).

The Mexican Pharmacopœia has admitted under the name of

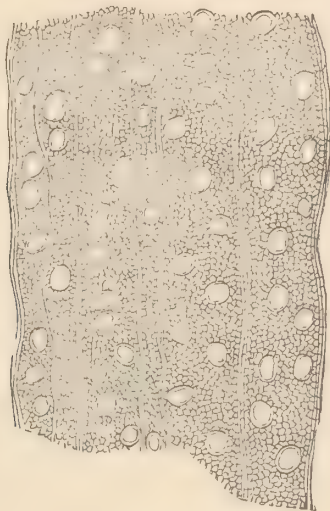
Yerba del Indio, a drug derived from *Aristolochia fatida*, Kunth; but it is evident from the description of “yerba del indio” of the Mex. Pharm. that this cannot be the parent plant of the root examined by Mr. Voelcker. The facts as far as accessible to Professor Maisch at the present time point to the identity of the three samples of roots mentioned above, and that they have been derived from the neighborhood of the Rio Grande. From the brief history given it is not in the least surprising that in some localities of Texas this root should have become popularly known as “raiz del indio,” and the herbaceous plant yielding it as “yerba del indio,” which latter name has long been applied in the interior of Mexico to a woody climber, the root of which, doubtless, differs

from the former considerably in its morphological characters, as it differs in medical properties.—*Amer. Jour. Pharm.*, March 1886, 115-117.

SANTALACEÆ.

Indian Sandal Wood—Histology.—The histology of Indian sandal wood has been investigated by Mr. William Kirkby. The wood, which is the undoubted produce of *Santalum album*, is heavy and hard, but splits compara-

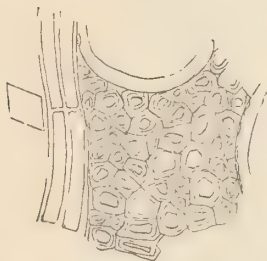
FIG. 1.



Macassar Sandal Wood: Transverse section of duramen.

× 64.

FIG. 2.



Showing crystal and parenchymatous oil cells. × 320.

FIG. 3.



Crystal-containing sacs, and crystals dissolved out with Schulze's Fluid.

× 220.

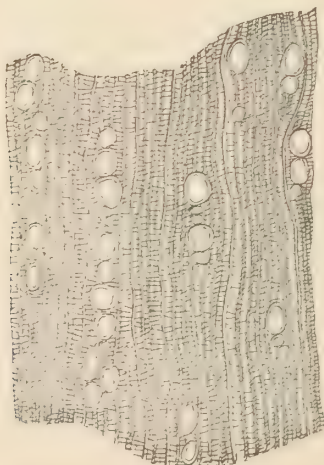
tively easy. It is reddish-brown, darker at the centre than at the periphery, and is marked with darker concentric zones. With a lens, the medullary rays and wide vessels are fairly well seen. The taste is aromatic, and the agreeable odor characteristic and persistent. The wood consists of tracheides, interspersed with solitary pitted vessels, and traversed

by narrow medullary rays (Fig. 1). The wood wedges vary in breadth from 25 to 294 micromm., the average being 145 micromm. The vessels measure from 42 to 84, average 54 micromm. Among the tracheides are parenchymatous cells (Fig. 2), having about the same diameter as the former, and containing the volatile oil; they are isolated, but two or three are close together. Cells containing crystals of calcium oxalate are arranged in vertical rows (Fig. 3), and seen single in transverse section. The medullary rays consist of two rows of thickened pitted cells, and contain resin.

Macassar Sandal Wood is lighter than water, cuts with difficulty transversely, but cleaves easily. The heart wood is pale fawn-colored or yellowish brown, with darker concentric zones, less strongly odorous than the preceding, and of an aromatic taste. Its histological structure is the same as the preceding, except that the wood wedges have an average breadth of 124 micromm., and the vessels an average diameter of 48 micromm. When sections of the wood are treated with solution of iodine, the volatile oil acquires an intense black color, such a color being not produced with Indian sandal wood oil. It is uncertain whether Macassar sandal wood is derived from *Santalum album*.

West Indian Sandal Wood.—The specimen examined by Mr. Kirkby was a section of a stem 57 mm. in diameter, the bark being 1 mm. thick; duramen (including pith, 1 mm.) 27 mm. in diameter; average thickness

FIG. 4.

West Indian Sandal Wood. Transverse Section $\times 30$.

of alburnum, 14 mm. Color of bark, grayish brown; alburnum, yellow with yellowish brown zones; heart wood, yellowish-brownish-gray, and in

the centre yellowish-grayish-brown ; with a light dot in the centre. The bark adheres closely to the wood, which is moderately hard, faintly odorous and nearly tasteless, while the bark has an odor resembling sandal, and a bitterish taste. The wood (Fig. 4) consists of xylem fibres, pitted vessels, and one-rowed medullary rays, the cells of which are thickened, tabular, and in the duramen, contain resin. The vessels vary greatly in size, and are usually in single radial rows of two to ten or more. Crystals of calcium oxalate are arranged in single vertical rows, and on transverse section, form usually loose concentric rings, each ring corresponding to one year's growth of the tree. The medulla cells are irregular hexagonal, thickened and pitted. No essential oil is present in the wood. Freed from cork, the bark is light red brown, and internally pale brown. Outside the narrow layer of cambium is a layer of soft bast tissue, made up of the usual elements. Next is a broad layer containing numerous bast fibres in loose layers, alternating with layers of soft bast tissue. Both these tissue systems contain numerous isolated oil cells, having a large diameter, and extended in a vertical direction. In about the middle of the outer cortical parenchyma is situated a layer of three or four tangentially extended sclerenchymatous cells, and isolated groups of stone cells are found scattered in the parenchyma. Two or three inner rows of the cork cells have colorless cell walls, the remainder brownish red. The average thickness of the soft bast layer is 100 micromm.; mixed bast layer, 500; cortical parenchyma, 200 (including layer of stone cells, 50), and cork, 200 micromm.

The West Indian Sandal Wood is not yielded by a sandal tree, its structure being entirely different. The Macassar wood is probably produced by a different species, or at least a distinct variety of *S. album*, since the woods of other santalacæ differ to scarcely any greater extent in structure, but exhibit no such peculiarity in the behavior of the oil towards iodine. —Pharm. Jour. and Trans., April 10, 1886, 858-860.

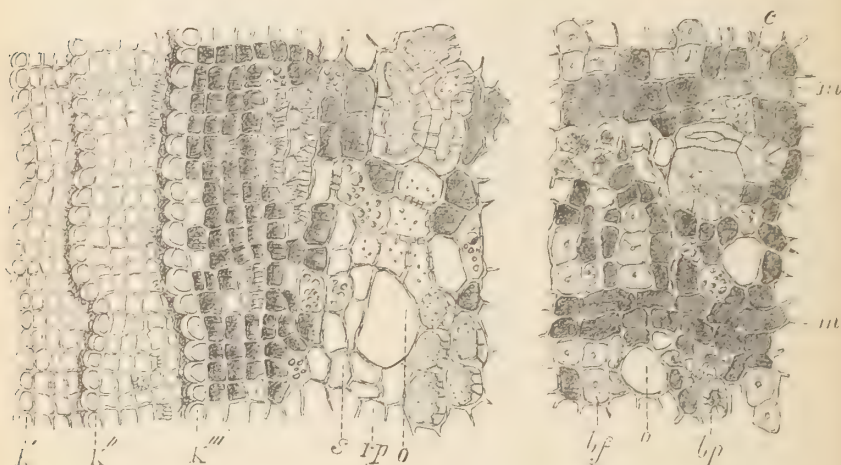
LAURACEÆ.

Ceylon Cinnamon—*Percentage of Ash*.—Prof. A. Hilger has caused five samples of Ceylon cinnamon to be examined in his laboratory with a view to the determination of the ash. The results obtained by Mr. Kuntze showed the samples to contain 4.5, 4.8, 3.9, 4.3 and 3.4 % of ash, of which 53, 72.3, 88.1 and 61.7 % respectively, was soluble in water ; the solubility of the last sample not being given.—Arch. d. Pharm., Nov. (1) 1885, 826-827.

False Clove Bark—*Characters, etc.*.—A false clove bark or clove cinnamon has been received by Dr. John Moeller, from Hamburg. It is in flat pieces of about the width of a hand, 7 mm. or less thick, cinnamon brown and covered with a thick, warty, ash-gray or yellowish-green cork ; the odor has a resemblance to sassafras, and the taste is sharp, entirely

unlike cloves and cinnamon. The periderm is sharply defined; a sclerenchyme ring is not observable; the middle bark is indistinctly dotted, and the inner bark darker and striate from delicate wavy medullary rays.

FIG. 5.



False Clove-bark—transverse section.—*k'* *k''* *k'''*, layers of cork; *rp*, bark parenchyme; *s*, crystal cell containing sandy oxalate; *o*, oil cells; *m*, medullary rays; *bf*, bast fibres; *bp*, sclerotic bast parenchyme; *c*, crystal cell.

Under the microscope, Fig. 5, the cork is seen to consist of a number of layers, sometimes twelve or more, the cork evidently having been developed centripetally from the epidermis, and the layers corresponding to different periods of vegetation, terminating with a row of cells resembling epidermal cells, with the outer wall rounded and thickened, while the remaining cork cells are nearly square, rather thick walled, and occasionally with a cushion-like thickening of the inner wall. Secondary cork has not been observed. The parenchyme of the middle bark (phellogen) contains numerous scattered cells with sandy crystals of calcium oxalate, and somewhat larger oil cells with colorless volatile oil; and many cells have their walls, particularly the inner one, materially thickened. The inner bark contains rather indistinct medullary rays, of one to four rows of cells; the bast parenchyme is often sclerose, the cells being staff-like or much enlarged and deformed; sieve tubes are present in rather distant groups; the crystal cells frequently contain several well-formed prisms; the bast fibres are single or in interrupted tangential rows, are spindle-shaped, about 0.5 mm. long, 35 micromm. broad, colorless, and upon cross section roundish rectangular and with a very fine cavity.

The parenchyme cells contain a homogeneous or granular red-brown

mass, insoluble in alcohol, partly soluble in water and alkalies, and colored green by iron salts. The bark is doubtless derived from a laurel, probably a species of *cinnamomum*; but it does not resemble any officinal bark, and in substance as well as powdered, it is easily distinguished from cinnamon by the large number of stone cells and the presence of staff cells, from clove bark by the presence of bast fibres, and from both by the deep brown-red contents of all parenchymatous cells.—*Pharm. Centralh.*, 1885, 251-253.

MYRISTICACEÆ.

Myristica surinamensis, Roland—*Description*.—C. L. Reimer and W. Will describe the fruit (seed?) as being of the size and shape of a cherry, and invested with a dark-gray ribbed and very fragile shell, enclosing a light brown hard kernel which is internally marbled white and brown; odor faint, aromatic; taste peculiar, somewhat resembling that of coconut oil. The shells weigh about 16 per cent., and the kernels yield with hot ether 73 per cent. of fat which is light brown-yellow, hard, crystalline, melts at 45°C., possesses a slight not disagreeable odor, and is readily soluble in ether, benzol and chloroform, but only partially so in petroleum benzin and hot alcohol, the latter solvents leaving 6.6 per cent. of a yellowish translucent caoutchouc-like substance. The fat now contains about 6.5 per cent. of free acid. It gives with strong sulphuric acid a fuchsin-colored solution which gradually becomes colorless, with the separation of brown flocks. The pure fat consists almost entirely of myristin and the free acid of myristic acid.

Myristica Bicuhyba, Schott.—The seeds have a black fragile testa with broad furrows, and a kernel resembling nutmegs in form, structure and size, and having an agreeable cacao-like odor, and a taste resembling that of butter of cacao, somewhat suet-like and with a bitter after-taste. The kernel is readily scratched with the finger-nail, and by trituration in a mortar is easily converted into a soft mass. H. Noerdlinger (*Ber. D. Ch. Ges.*, 1885, 2617), determined the seeds to contain water 6 per cent. and fat 59.6 per cent.; the shells constitute 15.5 per cent. of the weight, and contain 11.2 water and 2 fat, while the dried kernels contain 73.7 fat. The crushed seed subjected to hydraulic pressure yielded 47.56 per cent. of fat, and the press cake contained 8.86 water, 4.50 ash, 17.74 fat, 30.62 tissue, 17.62 protein, and 20.66 non-nitrogenous extractive. The fat extracted by ether is light yellow, and its ethereal solution yields shining white scaly crystals and a yellow oily mother-liquor. The expressed fat is yellowish-brown and the surface becomes covered with a white crystalline efflorescence; fused it is dark brown and congeals with a wavy surface. The fat melts at 42.5° to 43° C. and congeals at 32° to 32.5° C. It is readily soluble in hot ether, petroleum benzin, carbon bisulphide and chloroform, and partly soluble in hot alcohol. The fat

remaining in the press cake has a slightly higher melting and congealing point. The brown fat of the shell melts at 43° to 44° C. All these fats give with concentrated sulphuric acid a beautiful fuchsin-red color. The shells contain also a wax-like body melting at 74° to 75° C., and very sparingly soluble in hot ether.

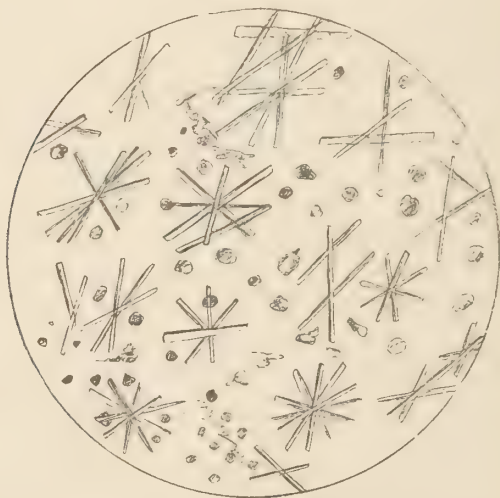
Analysis showed the fat to consist of the glycerides of myristic and oleic acids, the former predominating; together with small quantities of resins, free myristic acid, little volatile oil (the stearopten is not identical with myristic acid), about 0.1 per cent. of non-saponifiable oil, and a brown coloring matter.—*Amer. Jour. Phar.*, Feb. 1886, 88-89; from *Ber. D. Ch. Ges.*, 1885, 2011.

POLYGONACEÆ.

Polygonum Hydropiper—*Character of Active Principle*.—Dr. C. J. Rademaker, referring to the results of the analysis of *Polygonum Hydropiper* (see *Proceedings* 1885, 115) which led to the belief that the acid described by Dr. R. in 1871 was not a distinct principle but a mixture of tannic and gallic acids, insists that the principle discovered by him is

Polygonic acid and not a mixture, and that it has the same physiological action as the infusion and fluid extract of the drug, both of which he has used for a number of years. He has again prepared the acid from

FIG. 6.



Polygonic Acid from ethereal solution. $\times 700$.

“smart-weed” of his own collection, and states that this acid may be prepared by treating smart-weed with water to which some bicarbonate

of sodium has been added, and allowing to macerate for twenty-four hours; or, by precipitating a fluid extract of smart-weed with basic acetate of lead. In each case separate the base by means of sulphuric acid, and the organic acid by means of ether. Allow the ethereal solution to evaporate, and treat the residue with distilled water, and filter: this separates the resin (resinous acid). The filtrate is then filtered through animal charcoal repeatedly, until all coloring matter is removed. The filtrate is then treated with a solution of gelatin, in order to remove any tannic acid that might be present, again filtered and evaporated to dryness, redissolved in ether and the ethereal solution allowed to evaporate spontaneously.

Polygonic acid thus prepared crystallizes in needles (see Fig. 6). Its solution in water does not precipitate gelatin nor produce a bluish green discoloration when added to a mixture of ferrous and ferric salts in solution, showing absence both of gallic and tannic acids. It is freely soluble in water, less so in ether, and insoluble in petroleum spirit. The heat of a water-bath does not destroy any of its properties.—*Amer. Jour. Pharm.*, June 1886, 279-280.

Polygonum aviculare, *Lin.*—*Medicinal Uses.*—This plant, popularly known as *knot-grass* or *goose-grass*, and which was recommended by Dioscorides and Plinius as a remedy in fevers, and was subsequently employed in diarrhoeas, hemorrhages and as a vulnerary, has recently been recommended by Dr. Roschtschinin, of St. Petersburg, in bronchial catarrh, asthma and whooping cough, an infusion 30:1000 being given in doses of a glassful three times a day. Werner is said to have observed considerable quantities of an alkaloid in the plant. A. Buchner, in 1844, found the plant to be free from tannin, and the infusion made with diluted acetic acid to give a white flocculent precipitate with tannin, which was attributed to the presence of albumen; the same infusion neutralized with ammonia acquired a bright yellow color.

Prof. Falconi, of Cagliari, has successfully used the same plant in the initial stage of cholera, giving a decoction prepared from 100 gm. of the herb with 400 gm. water.—*Amer. Jour. Pharm.*, June 1886, 301.

Rhubarb—Peculiar Variety in Afghanistan.—Dr. Aitchison, botanist accompanying an expedition in Northern Afghanistan, states that a rhubarb plant occurs there which has usually only three root leaves, of immense proportions for the size of the flowering stem, the largest being four feet long and five feet broad; these leaves are pressed quite flat to the ground, reminding one of the *Victoria regia*, without the raised margin. The fruit is large, winged, and of a brilliant scarlet. There are only one or two minute leaves on the flowering stem. The root is called "fool's rhubarb" and possesses purgative properties, but the fruit is preferred as a purgative, and is given in the form of decoction.—*Nature*, July 9, 1885, 227; *Pharm. Jour. and Trans.*, Aug. 1, 1885, 109.

Rhubarb Root—Chemistry.—Prof. M. Kubli, starting with the assumption that there exists in rhubarb root (as well as in senna leaves and frangula bark) a peculiar body containing nitrogen and sulphur, which especially accompanies the active constituents of the drug with great persistency, records a series of experiments made to ascertain what part this peculiar body played in these vegetable substances, and whether it might not be considered as belonging to the non-organized ferments, such as emulsin, myrosin, etc. The present paper is a preliminary contribution to the solution of this question, and elucidates some interesting facts. It is shown that chrysophanic acid is first formed in rhubarb root upon digestion of the latter with water, and that therefore little or none of this acid exists preformed in the more important kinds of rhubarb. The formation of chrysophanic acid is due without doubt to the splitting off from the mother substance, chrysophan, effected probably by a ferment-like body, which is soluble in water, but not soluble in alcohol; it is for this reason that an alcoholic extract of the root can be evaporated without decomposition, since it contains the chrysophan to the exclusion of the body causing fermentation. The gradual formation of a deposit in extractions made with dilute alcohol (for instance, the tincture, which according to Clarke consists chiefly of chrysophanic acid), is explained by the fact that it contains besides the chrysophan also a part of the body capable of acting upon it as a ferment. The breaking up of the glucoside is therefore only imperfectly and gradually effected. In a watery extraction of rhubarb but little chrysophan can be expected, because under the conditions of its preparation the glucoside undergoes decomposition. On the other hand, all the separated chrysophanic acid will be found after the maceration in the residual marc; the residue after the preparation of *extractum rhei* (Pharm. Rus. Rep.) could therefore be profitably used as a source of pure chrysophanic acid. For this purpose the dried and powdered marc should be heated to boiling with three times its weight of alcohol of at least 90° Tr., in a retort provided with a return condenser, the temperature maintained five minutes, the liquor filtered, the residue boiled a second time with one and one-half times its weight of alcohol, again filtered, and the united filtrates allowed to stand twenty-four hours in the cold in a stoppered vessel. A large portion of the chrysophanic acid will separate in a granular crystalline condition. The remaining portion of the acid is obtainable by distilling off the alcohol and washing the residue with dilute alcohol, in which the acid is insoluble. The author holds that it is essential that the preparation of rhubarb root should contain the active constituents of rhubarb in their unchanged condition, and promises to give formulas for such in a future communication.—Pharm. Jour. and Trans., July 18, 1885, 65–66; Phar. Zeitsch. f. Russl. xxiv, 193.

Rhubarb—Occurrence of Nitrate of Potassium and Various Organic

Acids in the Stalks.—In the course of their experiments connected with the determination of *Glyoxalic* and *Glycosuccinic acids* (which see under "Organic Chemistry") in the juices of immature fruits and in rhubarb stalks, Messrs. Brunner and Chuard incidentally determined that the juice of the latter contains notable quantities of nitrate of potassium. So considerable is the quantity of this salt present that a single drop of the juice is sufficient to give immediately the nitric acid reaction with brucine and diphenylamine. Besides the above named organic acids, the authors determined the presence of succinic, malic and oxalic acids.—Pharm. Jour. and Trans., May 1, 1886, 917; Ber. d. D. Ch. Ges., xix, 595.

CHENOPODIACEÆ.

Phytolacca Decandra—*Value as a Remedy in Orchitis.*—According to the Lancet the fluid extract of *Phytolacca decandra* is used internally for orchitis, in doses of from 4 to 6 minims, every three or four hours. A salve made of the extract mixed with extract of belladonna is also rubbed into the skin over the affected part. The root is said to have antisyphilitic and antiscorbutic properties.—N. Y. Med. Jour., Jan. 23, 1886.

SOLANACEÆ.

Atropa Belladonna—*New Constituent.*—Mr. H. Kunz, during the course of experiments made to determine the alkaloids of belladonna, determined the presence of several bodies not hitherto described. The most interesting of these is a fluorescent body, having acid properties, which the author proposes to name *chrysotropic acid*. The presence of a fluorescent body in belladonna has been noticed at different times, as by Geiger (1843), Richter, Hübschmann (1858), and Fassbender (1876), but its exact nature does not appear to have been determined. In 1884, however, Eykmann obtained from *Scopolia japonica*, a plant nearly related to *Atropa belladonna*, a peculiar fluorescent body which he named *scopoletin* (see Proceedings 1885, 128), and which Mr. Kunz regards as identical with the acid body obtained by him from belladonna, notwithstanding that it differs in some of its relations. Chrysotropic acid constitutes a yellow, microcrystalline powder, is soluble in 70–80 p. of hot, and with difficulty in cold water, more readily in cold, and still better in hot alcohol. The concentrated aqueous or alcoholic solution has a yellow color by transmitted light, but shows a handsome emerald green fluorescence by reflected light. Under the latter conditions the dilute aqueous solution shows a quinine blue, and the alcoholic solution a bluish-violet color. The acid is very sparingly soluble in cold ether, somewhat more readily in hot ether. Its composition corresponds to the formula $C_{12}H_{10}O_5$. Along with chrysotropic acid, the author isolated a second new acid, which he has named

Leukatropic Acid. ($C_{17}H_{22}O_5$).—This occurs in form of white silky-

glistening scales, is practically insoluble in water, perceptibly soluble in boiling water, in which it melts, floating upon the surface in oily drops and depositing them on cooling in form of microscopic needles. It is also sparingly soluble in ether, but more readily in alcohol.

Besides the above acids, the extract prepared from the herb contains about 0.6 per cent. of *succinic acid*. The extract of belladonna also contains about 1.8 per cent. of *bilineurin* and about 1.0 per cent. of *cholin*, whilst these substances are also found in extract of *hyoscyamus* to the extent of 0.5 and 0.3 per cent. respectively.—Arch. d. Pharm., Oct. 1885, 721-735.

Dr. Heinrich Paschkis claims to have observed and isolated the fluorescent body described by Mr. Kunz before the publication of that author's paper. His results correspond in the main with those of Mr. Kunz, and he regards the substances obtained by them to be identical with the scopoletin of Eykman. He sees no reason, however, for adopting the new name for the substance proposed by Mr. Kunz, and prefers to designate it by the name of *Scopoletin* as originally proposed by Eykman.

Dr. Paschkis records some pharmacological experiments made with the new substance, particularly with the view to find a certain method for determining the presence of belladonna in forensic examinations. He was able to determine the presence of *Scopoletin* by its peculiar fluorescence in the urine, and, though more faintly, also in the liver of a rabbit poisoned by belladonna leaves.—Arch. d. Pharm., Feb. 1886, 155-158.

Belladonna—*Determination of Alkaloid in the Extract*.—Which see under "Pharmacy."

Atropa Belladonna—*Estimation of Alkaloid in the Leaves*.—Messrs. Wyndham Dunstan and Francis Ransom have continued their researches on the estimation of alkaloids in *Atropa Belladonna*. They have now sought to devise a reliable and convenient process, whereby the alkaloids may be isolated without loss in a pure state from the leaves, which is briefly as follows: Twenty grammes of the dried and finely powdered leaves are well packed in an extraction apparatus and exhausted with about 100 cc. of *absolute* alcohol. The alcoholic liquid is diluted with about an equal volume of water made slightly acid with HCl. The chlorophyll, fat, etc., are then removed from the slightly warmed liquid by repeatedly extracting with chloroform until nothing further is removed by the solvent. The aqueous liquid is made alkaline with ammonia and the alkaloids extracted by chloroform, when, upon evaporation of this chloroform solution, and drying to constant weight at 1000 C., the percentage of total alkaloid is obtained. Specimens of foreign leaves, so treated, gave 0.22 per cent., and of English leaves, 0.15 per cent. of total alkaloid, though the authors mention that the latter had been overheated in the drying and that they have reason to believe that carefully grown and

gathered English leaves would give a better yield than either of the above.
—Year-book of Pharm., 1885, 391-393.

Belladonna Leaves—Comparative Quality.—Mr. Virgil Coblentz has contributed an interesting paper on the comparative quality of belladonna leaves to the Ohio State Pharmaceutical Association (1885), from which the following is abstracted :

The samples of leaves examined were such as are usually supplied to the trade, including those in pressed packages, with the loose German and Allen's English. Several of the American pressed were musty, consisted largely of stems, and yielded a less percentage of alkaloid, whilst others yielded an amount comparing favorably with the best foreign leaves. The German leaves also varied very considerably. The results are summed up in the following table, the method, which is given in detail, being the same for all, and indicating the amount of alkaloid (atropine and hyoscyamine) in 100 parts of the dry leaf as the alkaloidal residue, as well as the pure alkaloid :

<i>American Leaves.</i>		
No.	Alkaloidal Residue.	Pure Alkaloid.
1	.0179	.0171
2	.0095	.0090
3	.0205	.0182
4	.0439	.0433
5	.0405	.0398
6	.0050	.0020
7	.0117	.0109
8	.0092	.0090
<i>German Leaves.</i>		
1	.0221	.0212
2	.0432	.0420
3	.0185	.0180
4	.0127	.0109
<i>English Leaves.</i>		
1	.0426	.0422
2	.0417	.0411

Amer. Drug., July 1885, 126-127; Proc. Ohio State Pharm. Assoc., 1885.

Datura—Treatment of Poisoning by the Fruits.—A Hungarian physician has treated a recent case of poisoning by thorn-apple fruits successfully by administering pilocarpine hypodermically. The remedy was administered to a child six years old in doses of $\frac{1}{16}$ grain, increased to $\frac{1}{4}$ grain, until in 5 hours $\frac{3}{4}$ of a grain had been administered. None of the symptoms produced by pilocarpine appeared until the last dose had been taken.—Pharm. Jour. and Trans., Oct. 3, 1886, 288; from Med. Times, Sept. 19, 411.

Datura—Species Occurring in the Sahara.—Mr. Bousson reports a num-

ber of cases of poisoning by the leaves of a *Datura* of the Sahara, known by the name of

El Bethina.—Complete prostration is produced, which after a long sleep may pass off without leaving any serious effects. Larger doses produce delirium, with great thirst and ultimately death. The Arabs use as an antidote a mixture of dates triturated with water, and a sauce containing a considerable quantity of pepper (*felfel*) and butter. The remedy, taken freely by the patient, produces much sweating, and after twelve hours the patient is out of danger, without having experienced any hallucinations.—*Amer. Jour. Pharm.*, Feb. 1886, 90; from *Arch. Méd. et Phar. Mil.*

Fabiana imbricata, *Ruiz et Pavon*—*Medicinal Uses*.—Dr. A. Rodriguez has recently called attention to this plant as being valuable in catarrh of the bladder from lithiasis, in certain liver affections and in dropsy. Its strong odor is due to a volatile oil, and it is said to contain also considerable resin and a fluorescent principle crystallizing in needles and resembling *æsculin*. Filhol (*Compt. rend.*, 1.), determined the presence of crocin in *Fabiana indica*. It is a Chilean shrub, about 15 feet high, with numerous branches, small imbricate leaves, and purplish-colored flowers. In its native country it is known as *pichi*, and has been employed for a long time in various diseases of the urinary organs, and also in certain diseases of the sheep and goat.—*Amer. Jour. Pharm.*, Feb. 1886, 90; from "Diasio Med. Farmac."

Fabiana imbricata, *Ruiz et Pavon*—*Botanical and Pharmacognostic Characters, Chemical Examination, etc.*—Dr. Rusby having drawn attention to a new drug which, under the name of

Pichi, has acquired considerable reputation in Chili in the treatment of urinary affections, Dr. A. B. Lyons presents some preliminary notes on its natural history, as well as the results of a preliminary examination of the drug.

The drug is the product of a solanaceous plant—*Fabiana imbricata*, *Ruiz et Pavon*; subtribe *Fabianeæ*, *Miers*—a shrub or small tree, growing on rocky, sterile hill-tops in Chili. As imported, it consists of the branches and leafy branchlets of the shrub, and these bear a close resemblance in general aspect to those of a cedar. The highly resinous character of the drug, and its aromatic odor and taste, recall the familiar *arbor vitæ*, although the foliage bears a closer resemblance to that of the red cedar. In absence of flowers and fruits, even an accomplished botanist would scarcely recognize under such a disguise a member of the natural order *solanaceæ*.

The accompanying illustrations (Figs. 7 and 8) render minute description of the drug superfluous. The larger stems, 1 to 2 cm. in diameter, are covered with a thin, rather smooth bark, obscurely wrinkled longi-

FIG. 7.

FIG. 8.

7. *Fabiana imbricata*. Branch, natural size.

8. " " Stems, natural size.

tudinally, the surface more or less distinctly tuberculate, color brownish gray, with darker or lighter patches. The bark is firmly adherent over a yellowish-white, tough, compact wood. The smaller twigs, 2 to 5 mm. in diameter, are of a darker color, and show (when stripped) at regular intervals scars indicating the points of insertion of the minute leaf-sprays. The leaves are minute scales, about 1 mm. in length, closely imbricated on these numerous sprays.

Dr. Rusby gives the following graphic description of the shrub as he saw it growing in its habitat: "Growing upon high, dry hill-tops, where there is a somewhat sparse vegetation, its plume-like sprays, with their peculiar light, bluish-green color, present a rather pretty appearance against the sky, although the shrub is somewhat straggling; more so here than in the south, where it becomes a small tree. Seeing one of these sprays without flowers for the first time, it is hard to realize that it is not a conifer, and seems almost incredible that it is in the tobacco family. Handling it, Dr. Rusby was astonished at the great amount of resin with which all its tender parts are covered, this coating, perfectly impervious to water, being an admirable provision of the plant against the loss of its small supply of water during the long droughts of this region." In further description of the plant, the doctor says: "The minute branchlets (Fig. 9) are densely crowded, and terminated in the second year by

FIG. 9.

9. *Fabiana imbricata*. Branchlet, $\times 3$ diameters.

the solitary flower. The white, nerved, withering, persistent corolla is $\frac{1}{2}$ inch long, four times the length of the bell-shaped calyx, funnel form, with fine lobes. Fruit an oblong, ovoid, light-brown, crustaceous capsule, $2\frac{1}{2}$ lines long; seeds about four, $\frac{1}{2}$ line long."

Dr. Lyons' preliminary examination of the drug leads him to the following results:—

1st. A minute quantity of some alkaloid, probably peculiar to the drug, and capable of forming crystallizable, bitter salts.

2d. A neutral, crystallizable principle, rich in carbon, insoluble in water, tasteless, and probably inert.

3d. A fluorescent body (perhaps more than one) closely resembling æsculin.

4th. Volatile oil.

5th. A bitter resin, probably complex in composition, present in great abundance, soluble in alkalies, precipitated by acids, not fluorescent, soluble in ether and chloroform, very sparingly in water and in petroleum ether.

It seems probable that the three last named constituents are the important ones, unless, indeed, there be a bitter addition to the fluorescent principle, which dissolves somewhat freely in water. The tincture of the drug has a very clinging, disagreeable bitter taste, and unless alkali is added, it precipitates much resin when mixed with water.—*Amer. Jour. Phar.*, Feb. 1886, 65-71.

Capsicum—Commercial Quality of the Powder.—Mr. S. W. McKeown has examined about a dozen samples of adulterated capsicum, and found corn meal to be the adulterant in all except one. Pure capsicum contains no starch, and a portion boiled with a little water and treated with two or three drops of tincture of iodine, should produce no blue coloration. The ash should be white and amount to about 4.50 per cent. Exhausted with 94 per cent. alcohol, it should yield about 28 per cent. solid extract. A mixture of equal parts of capsicum and corn meal will, on the contrary, yield only about 14 or 15 per cent. alcohol extract under the same treatment. In the following table some of the author's results are given:

	Adulterant.	Alc. Ext.	Ash.
Cayenne pods	pure	24.95	4.50
New York	pure	38.73	4.39
New York	pure	27.85	4.55
New York	pure	29.33	4.95
Philadelphia	cornmeal	20.52	7.73
Philadelphia	cornmeal	15.13	3.84
Cleveland	cornmeal	14.97	
Youngstown	doubtful	13.62	7.72
Youngstown	cornmeal	12.87	5.37
Youngstown	cornmeal	12.32	4.37

—*Amer. Drugg.*, July 1885, 128; *Proc. Ohio State Pharm. Assoc.*, 1885.

Tumbeki—*A Persian Variety of Tobacco*—Mr. E. M. Holmes has made inquiries into the nature and botanical source of “tumbeki,” a narcotic leaf used in Persia and Turkey for smoking, and known to be a regular article of commerce between the two countries. In the “Treasury of Botany” it is stated to be the narcotic leaf of a species of lobelia, but the author’s inquiries soon developed the fact that it is the leaf of a species of *Nicotiana*—*N. persica* according to one authority, and *N. rustica* according to another. The leaves subjected to examination by the author were obtained both from Trebizond and Constantinople, and compared with *N. persica*, but not with *N. rustica*. This variety of tobacco being stated to be stronger than ordinary tobacco, the author supplied Messrs. E. J. Eastes and W. H. Ince with some specimens, who report the result of their analysis of 4 samples in detail, and append to their paper the following

GENERAL TABLE OF RESULTS.

	Ispahan.	Hidyas.	Kechan.	Shiraz.
Nicotine	5.4945	2.046	2.909	5.835
Saccharoid matter	2.64	2.85	5.58	3.355
Saccharoid matter after Pb. treatment .	2.51	2.80	5.33	3.49
Soluble in water	42.00	42.30	39.90	55.60
Insoluble in water	58.00	57.70	60.10	44.40
Ash	22.00	28.50	28.50	26.15

The second determination of saccharoid matter was made after treatment with basic acetate of lead, which is said to remove fermentable saccharoid matter from the kindred plant, tobacco. The results show that such is not the case in the instance of infusion of tumbeki. *Phar. Jour. and Trans.*, Feb. 13, 1886, 681–682 and 682–683.

OLEACEÆ.

Fraxinus Americana—*Proximate Examination of the Root Bark*.—Mr. Jos. G. Roberts obtained the following results with the root bark:

1. Moisture, loss by drying at 105° C., 9.63 per cent.
2. Ash, 5.33 per cent. Of this amount 6.25 per cent. were soluble in water, 86.67 per cent. soluble in dilute hydrochloric acid, and the remainder soluble in caustic soda.
3. Benzol extracted 0.67 per cent. containing a little volatile oil. The filtered aqueous solution of the extract gave a precipitate with phosphomolybdic acid; the portion insoluble in water was resin, and dissolved in 80 per cent. alcohol.
4. Alcohol (80 per cent.), yielded a brown, somewhat bitter and acrid extract, which on being treated with various solvents and chemicals showed the presence of tannin, alkaloid, resin and sugar.
5. The remaining constituents found were gummy matter, starch, and coloring matter.

Glucosides could not be detected. The volatile oil was of a yellow color, somewhat aromatic, and had a rather bland taste. The amount of alkaloid obtained was very small; it refused to crystallize, and was contaminated with coloring matter.—*Amer. Jour. Pharm.*, Mar. 1886, 117; from the author's thesis.

Ditana digitifolia—*Value as a Galactagogue*.—Professor Prota-Giurleo calls attention to *Ditana digitifolia*, a Mexican plant, as possessing remarkable galactagogue properties. He mentioned several cases, reported in Italian journals, in which the administration of an infusion (neither parts of the plant nor strength are stated) to nursing women had exercised a marked influence upon the milk glands, inducing a considerable secretion of milk, even in cases where it had been nearly or entirely suppressed. An ethereal tincture of the flowers, made into an elixir with syrup, is said to have been brought out by an Italian pharmacist under the name of "galattofore."—*Pharm. Jour. and Trans.*, Dec. 26, 1885, 542; *Pharm. Post*, Nov. 28, 1885, 1276.

Ligustrum vulgare—*Anti galactagogue Properties*.—Professor Giurleo directs attention to this plant, which, antagonistic to *Ditana digitifolia* (which see above), has the power to suppress the secretion of milk, being similar in this respect to *Rhamnus Alaternus*, which, he states, had been employed for this purpose forty years ago but since overlooked. The leaves of *Ligustrum vulgare* are best administered in form of an infusion of 3 grams in 150 grams of water twice in twenty-four hours, this dose being repeated for several days.—*Pharm. Jour. and Trans.*, Dec. 26, 1885, 542; *Pharm. Post*, Nov. 28, 1885, 1276.

VERBENACEÆ.

Verbenaceæ—*Useful Species*.—Prof. John M. Maisch draws attention to some useful species of *verbenaceæ*, a natural order which has thus far not yielded any drug possessing very important medicinal properties. The natural order of *verbenaceæ* comprises in the neighborhood of seven hundred species, which are mostly indigenous to tropical countries. One of the most important species is

Tectona grandis, Lin. fil., the East Indian teak tree, which grows in Hindoostan, Siam and the Malayan Islands. The wood is renowned for its hardness and durability. The leaves have an acidulous and bitterish taste, and are employed for their mild astringent properties, and as a purple dye. The small white fragrant flowers are believed to possess diuretic properties.

Gmelina arborea, Roxburgh, is likewise an East Indian tree. The root has been employed in gout, the bark in intermittent fevers. The leaves and roots of

Gmelina parvifolia, Roxburgh, and *G. asiatica*, Lin., both of them smaller species, possess demulcent properties. The root of

Aricennia tomentosa, Lin., is mucilaginous, while the unripe fruit has been employed as an emollient cataplasm. An allied species,

A. nitida, Jacquin, known in the West Indies as black or olive man-grove, furnishes the so-called *courida bark*, which is used in tanning. The leaves and root of

Clerodendron infortunatum, Lin., an East Indian shrub, are employed externally for tumors and skin diseases, internally as a tonic, while the stronger odorous and more decidedly bitter root of

C. inerme, R. Brown, is regarded as possessing both tonic and alterative properties, being particularly useful in venereal and scrofulous complaints. Several species of

Vitex, namely *V. Negundo*, *V. incisa* and *V. Agnus-casti*, Lin., are cultivated in this country. The globular fruit of the latter, which is indigenous to the basin of the Mediterranean, has a strong aromatic, somewhat narcotic odor and a peppery taste. The leaves are likewise pungent. Both are frequently used as stimulants and irritants. The fruit was examined by Landerer in 1835.

The herbaceous portion of the different species of the genus

Lantana, indigenous to tropical America, is more or less agreeably aromatic, and is popularly employed in the native countries of the different species for its sudorific action externally in fomentations and cataplasms.

L. Pseudotheca, St. Hil., is probably the most important species, being used in Brazil in place of Chinese tea. The genus

Lippia embraces a number of useful species. Among these

L. nodiflora, Richard, which is frequently met with in damp localities in our Southern States, possesses mild aromatic and tonic properties, and has been employed as an aromatic and against snake bites. Another species,

L. citriodora, Kunth. is the well-known lemon verbena, which has been subjected to proximate analysis by Oliva. It is employed as an anti-spasmodic. Dr. Podwissotzki has submitted the herb of

L. mexicana to analysis, and found tannin, a quercetin-like principle, liquid volatile oil, and a camphor-like body which he named *lippiol*. The author has been unable to find any mention of this species, and considers it probable that Dr. Podwissotzki's researches have reference to a labiate plant—*Cedronella mexicana*, Benth— which has similar properties, and which has been admitted into the Mexican Pharmacopœia under the name of *toronjil*. The Mex. Pharm. has also admitted two species of *Lippia*,

L. graveolens, Kauth, and *L. dulcis*, Treviranus, under the name of "yerba dulce." These are used in the form of infusion for their demulcent, pectoral and emmenagogue properties. The second named has been subjected to proximate examination by Rio de la Loza.

Of the *Verbenas* proper, which genus is well represented in our gardens,

Verbena Aubletia, Lin. is indigenous to North America, from Virginia and Illinois northward, and westward to the Rocky Mountains. It is reported to possess acrid and mucilaginous properties.

V. officinalis, Lin. a European weed, is somewhat naturalized in this country. It possesses mild stimulant, tonic and astringent properties, and is recognized by the French Codex as *verveine officinale*. Among North American species,

V. bracteosa, Michaux, has the reputation of being useful in scrofulous complaints.

V. hastata, Lin., the homely blue vervain, has been employed in fevers, and as an emetic.

V. urticifolia, Lin., the coarse-looking white vervain, is reputed to be useful in various complaints, and as a topical application in poisoning by *Rhus Toxicodendron*. Finally,

Stachytarpha (*Verbena*, Lin.) *jamaicensis*, Vahl, is popularly used for a variety of diseases in some of the West India Islands and Central America. It seems to be most useful as a diaphoretic and tonic. Amer. Jour. Pharm., July 1885, 330-335.

Lantana brasiliensis.—Occurrence and medicinal properties of an alkaloidal constituent, *Lantanine*, which see under "Organic Chemistry."

LABIATÆ.

Peppermint—Cultivation in Michigan.—From his personal observation in the peppermint plantations, and from information received from mint growers, Dennis Reagan, Ph. G., describes the cultivation to be the same as was stated by M. Fred. Stearns, in 1858 (see Proceedings 1858, p. 449), except that the planting is done annually, the runners of the preceding year being used for the purpose. If the plants are raised from seeds in a nursery, they are reset every two years. Peppermint does not sprout freely after the second year, unless the soil is very rich and loose and the preceding summer has been wet and warm, or the ground is boggy.

The oil obtained per acre varies between three and twenty-six pounds, the average being about sixteen pounds; new mint generally yields a few pounds more than the old, the quality of the oil being the same. The principal weed growing in the mint fields is *Erigeron canadense*, Lin.; the large growers remove it carefully from the field, and plants which are overlooked are separated from the cut mint, which is smaller. *Erechthites hieracifolia*, Raf., grows only in new clearings. Both these weeds are sometimes distilled separately, and the oils are occasionally used for adulterating oil of peppermint; oil of turpentine is also

used for the same purpose. Oil of peppermint, when pure, is said to be rather slowly absorbed if dropped upon blotting paper, while it is at once absorbed if adulterated with any one of the three oils mentioned.—*Amer. Jour. Phar.*, Dec. 1885, 599.

Japanese Peppermint—Original Description of Two Species.—The botanical relation of the Japanese peppermint plant to other members of the genus *Mentha* has been studied by numerous authorities during the last few years, since menthol has become an important article of trade, without, however, reaching any very definite conclusion. With a view to giving some further aid in clearing up this vexed question, the "*Amer. Drugg.*" (June 1886, 101-102) reviews the opinions that have been given during the past few years, and reproduces the illustrations of two Japanese species of *Mentha*, *M. crispa* (Oranda Hakuku) and *M. arvensis* (Megusa) from the celebrated Japanese work, "*So moku dzu setzu*," together with the original text, both being electrotyped from photographs taken by the reviewer. The following translation of the text, by Mr. K. Tamari, of the Imperial University, Tokio, may properly find place here:

So moku dzu setzu, vol. xi. [Plate 27], Megusa. *Mentha arvensis*, L. [var. *vulgaris* Benth.] This should now read: Var. *piperascens*, Malinvaud.

Megusa—Hakuku.—(Var. A.), grows wild occasionally. Shoots out in spring from its perennial roots. Stem square, two feet high; stalks and leaves downy; leaves opposite, petiolate, ovate but pointed, serrated; the upper surface deep green; under surface of a purplish color—in shady places sometimes not purplish—which, when the plant is fully grown, looks faded. In the fall, many short branches come out at every node, which soon bear flowers or spikes. The flower is bell-shaped, corolla toothed, white, with greenish-purple tint, containing four stamens and one projecting pistil.

Var. B. Habits and growth of this are the same as those above mentioned for Var. A. It is a little larger, stamens and corolla of light reddish hue, holding white pollen dust on the reddish stalk; pistil still more projecting.

Var. A. Latin: *Mentha gentilis*; Dutch: *Hofmunte*.

Var. B. Latin: *Mentha sativa*; Dutch: *Zaaymunte*.

Mentha piperita, L., resembles hakuku, but the former has terminal flowers, while the present variety has axillary flowers. They have, however, the same merit [properties], so that the name may be applied to them both.

Oranda Hakuku.*—Labiatae [Dutch or European *Mentha*].

Leaves not petiolated, heart-shaped, somewhat thick, deeply serrated, smooth but wrinkled by veins. Flowers on terminal spikes about one inch. Although the flower is like that of the native plant, "there is no

identification on corolla," which is of a light reddish color; stamens inserted in corolla.

Latin name: *Mentha crispa*; Dutch: *Kruizemunt*.

Linné describes the stamens as being of the same length as the corolla, but the plate represents them longer. Regarding the present variety of mentha, Linné says that it seems to be superior in quality to Hofmunte (*M. arvensis*).

Lavender—Cultivation at Brighton.—Mr. E. M. Holmes communicates some interesting information respecting the cultivation of medicinal plants at Brighton. Speaking of lavender, he says that it might be supposed that so distinct a plant as lavender would not exhibit many varieties. This, however, is not the case. The first plants experimented on developed in the form of dense level-topped rounded tufts of foliage, with comparatively few flower heads. Each flower head formed a continuous spike, except the lowest whorl or verticillaster, which is separated from the upper portion of the spike by a short distance. This variety neither grows rapidly nor flowers freely, and the perfume is not so fragrant as in the other varieties. Another variety was tried, in which nearly all the floral whorls are distinct, so as to form an interrupted spike. This variety grew rapidly, flowered freely, and was found to be delightfully fragrant, and was, therefore, adopted. It has the disadvantage, however, that the plant soon forms woody stems which, if the plants are much exposed to wind, easily break, and loss of flowers results. Although this variety has been largely propagated by cuttings, it does not always come true, several specimens having been pointed out to the author which were of sparing habit and flowering very scantily, with herbage of a much whiter hue, and others with few flower heads of a more purplish hue than the rest, and deficient in fragrance. All these varieties presented the characteristic rhomboidal bracts of the true lavender. It is obvious, therefore, that the cultivation of lavender requires constant attention and habits of close observation on the part of the cultivator, and that the quality of the oil produced is likely to depend not only on the care with which the oil is distilled, but on cultivating only the best and most fragrant varieties, as well as on the character of the soil. The chalky character of the soil near Brighton seems peculiarly suited.—Phar. Jour. and Trans., Aug. 8, 1885, 125.

Terrilla ocymoides.—Uses of the fixed oil of the seeds in Japan. See *Fixed Oils* under "Organic Chemistry."

BORRAGINEACEÆ.

Alkanet—Percentage of Anchusin in Commercial Specimens.—Mr. C. J. S. Thompson has determined the amount of coloring matter—anchusin—in commercial samples of alkanet root. The process consists in exhausting the root with ether, evaporating and weighing residue. The

samples examined yielded 5.50, 5.25, 5.63 and 6.02 per cent. of coloring matter by this process.

Anchusin is soluble when treated directly with any of the alkaline hydrates, and changes to a rich deep blue, which on the addition of an acid resumes its crimson color. The author observes that it will be found quite as delicate a test as litmus, a single drop of a dilute acid being sufficient to produce the change of color. A solution of anchusin in alcohol changes color in the same manner on the addition of an alkali. Anchusin paper may be prepared and used with exactly the same results as that made with litmus.—Pharm. Jour. and Trans., April 10, 1886, 860.

CONVOLVULACEÆ.

Jalap.—*Distinctive Characters of the Powdered Root under the Microscope*.—Professor Herlant observes that it would be exceedingly easy to detect the presence of the root of *Mirabilis Jalapa* in powdered jalap, since it is characterized by the presence of abundant acicular raphides of oxalate of calcium. The distinctive characters under the microscope of Tampico and Vera Cruz jalap depend on the different appearances presented by the starch and resin in the two tubes. In the former the starch is arranged in little compact masses in the cell, whilst in the latter it occurs in grains irregularly united, or, if isolated, much larger than those of Tampico jalap. In the tubes of the last named the resin occurs in smaller agglomerated masses than in the Vera Cruz jalap.—Pharm. Jour. and Trans., May 1, 1886, 917; Rép. de Pharm., April 1886.

Scammony.—*Examination of Commercial Samples*.—Mr. Chas. M. Reber examined samples of commercial scammony; the results, arranged according to the amount of resin obtained, were as follows:

1. Starch present; 26 per cent. soluble in ether.
2. Starch present; 40 per cent. soluble in ether.
3. Starch present; 78.30 per cent. soluble in ether.
4. Starch absent; 79.23 per cent. soluble in ether.
5. Wholly soluble in ether. This specimen was a rather fine, light yellowish powder, and had the odor and taste of scammony; it was resin of scammony.

None of the samples produced any effervescence with hydrochloric acid; and the resin was, in all cases, soluble in hot solution of potassa, and not precipitated on the subsequent addition of an acid.—Amer. Jour. Phar., March 1886, 118; from the author's thesis.

BIGNONIACEÆ.

Jacaranda lancifolia.—*Medicinal use and probable Botanical relation*.—Under the above name the leaves of a plant from Columbia, South America, have been experimented with by Drs. Murray Smith, Alfred Wright and Z. Mennell, and were found to be very useful in cases of

gonorrhœa, syphilis, and in vesical affections attended with purulent urine.
—*Brit. Med. Jour.*

Professor Maisch believes the plant named to be identical with

Jacaranda procera, Sprengel, a description of which will be found in Proceedings 1882, 176-177. The leaflets are very variable in shape, and *J. lanceolata*, Velloso, he believes, is regarded merely a variety of the species named.—*Amer. Jour.*, Oct. 1885, 483.

Gelsemium sempervirens—*Poisonous character of Honey produced by Bees visiting the Flowers*.—See "Honey."

APOCYNACEÆ.

Apocynum cannabinum and *A. androsaemifolium*—*Microscopic Characters*.—Prof. E. S. Bastin communicates a highly interesting paper in which he gives a description of the microscopic characters of the roots of the two plants above named. The paper is accompanied by copious illustrations which aid in making the test perfectly plain. Reference must, however, be had to the original paper in "The Pharmacist," October 1885, 297-303.

Asclepias Cornuti, Decaisne—*Percentage of Caoutchouc*.—Dr. Geo. Kassner has made experiments to determine the amount of caoutchouc obtainable from the milky juice as well as from the dried plant of *Asclepias Cornuti*, Decaisne (*A. syriaca*, L.). The fresh latex was found to contain 6.2 per cent. The percentage of total extract obtainable by benzin, bisulphide of carbon, etc., of crude caoutchouc, and of pure caoutchouc, was determined in the young stem of the plant gathered in May, in the stem gathered in August and September, and in the leaves gathered at different periods. In the young stem he found 0.15 per cent.; in the stems gathered in August 1.13 per cent.; in those gathered in September, 1.61 per cent. of caoutchouc. Leaves were found to contain from 1.33 to 1.61 per cent. of pure caoutchouc.—*Arch. d. Pharm.*, February (1) 1886, 97-103.

Madar—*Chemical Examination*—In India, under the popular name of "mādār," two plants belonging to the natural order of asclepiadaceæ are known—the *Calotropia gigantea*, or *Asclepias gigantea*, and the *C. procera*, or *C. Hamiltonii*. The root barks of the two plants are the portions employed, and these, as well as the plants yielding them, have been sufficiently described in their botanical, pharmacological and medicinal relations, by Watt, Dymock, and others. Messrs. C. I. H. Warden and L. A. Waddel have now subjected madar (from *c. gigantea* (?) Rep.) to chemical examination, the part of the plant employed being the root-bark, the roots having been dug up in September. After the bark had been separated from the roots it was dried by exposure to air, and then reduced to powder. Dried at 100°C. the powder lost 8.079 per cent.

1000 grams percolated with 60% alcohol yielded 68.6 grams of extract. The concentrated alcoholic solution of the bark was of a dark yellow color, and an acid reaction. On standing for some time, resin separated and the sides of the capsule became coated with small, white, roundish, nodulated masses, which were indistinctly crystallized. The extract was of a dark brown color, and had a heavy, unpleasant odor. It was placed in a bottle, dilute caustic soda added, and the mixture repeatedly agitated with ether. The ether was then agitated with dilute sulphuric acid. By operating in this way three fractions were obtained: *A.* Caustic soda solution; *B.* Ether solution; *C.* Sulphuric acid solution. A fourth fraction, *D.*, was obtained by drying the exhausted bark, extracting it with light petroleum ether, evaporating the latter, and drying the extract (amounting to 0.854% of the bark) at 100°C. Fraction *A.* yielded an

Acid resin, amounting to 0.997% of the bark. It was obtained in form of a chocolate-colored precipitate, soluble in caustic soda, potash and ammonium, and yielding insoluble amorphous salts with barium and calcium. Its alcoholic solution has an acid reaction. Fraction *B.* yielded 0.640% of a peculiar crystalline substance, which the authors at first considered as probably identical with List's *asclepiene*, but which on nearer examination they found to be distinct, and have named provisionally

"*Madar-alban.*"—It crystallized in dull, white, cauliflower-like masses, and when dried formed a bulky powder perfectly white, without odor or taste, insoluble in water, caustic soda, potash or ammonia, and practically insoluble in cold absolute alcohol. Associated with "*madar-alban*," the authors found a yellow resin, amounting to 2.471% of the bark, which they have provisionally named

"*Madar-fluavil.*"—It was amber colored, transparent, viscid at ordinary temperature, melted at 43° C., and had a slight odor. It was easily soluble in cold alcohol, ether and benzol, but insoluble in water, acids, and alkalies. From fraction *C.* a small percentage (0.093 %) of a

Yellow bitter resin was obtained, which the authors consider probably the active principle. It does not, however, appear to have toxic properties. Fraction *D.* consisted of

Caoutchouc, amounting to .855% of the bark. The fact that the sap of the madar plant contains in addition to caoutchouc two principles analogous to the *alban* and *fluavil* of gutta-percha is a point of some interest, especially as madar gutta-percha has been recommended as a substitute for the ordinary commercial article. Whether or not the madar plant—the supply of which is unlimited—can be employed as a commercial source of gutta-percha, is a question which can only be solved by actual experiment.—Phar. Jour. and Trans., August 22, 1885, 165–170.

Asclepias curassavica — *A. incarnata* and *Vincetoxicum officinale*.—*Characters of Active Constituent, Asclepiadin*, which see under "Organic Chemistry."

Nux Vomica—*Methods of determining the Value of Preparations*.—Mr. O. Schweissinger has furnished a valuable contribution on the subject of determining the strength of nux vomica preparations. He has considered in great detail the various methods that have been prepared and are in use for this purpose, such as by specific gravity, determination of the dry residue of evaporation, determination of alkaloid, and has endeavored by his experiments to point out the method or methods that by reason of their accuracy and rapidity of execution are best adapted to pharmacy. The author advocates the direct determination of the alkaloids of nux vomica in both the tincture and extract, making this tincture correspond to 0.2 per cent. of total alkaloid, and the extract to 15 per cent. Of the volumetric methods examined by the author, viz., titration with potassium-mercuric iodide, with iodine, and with hydrochloric acid, he finds the last named to be most reliable. He finds that even with relatively small quantities of alkaloid titration, $\frac{1}{100}$ normal hydrochloric acid gives good results. For the particulars of the author's very interesting experiments reference must be had to the original paper in Arch. d. Pharm., Aug. 1885, 579-590, and Aug. 2, 1885, 609-621.

See also under *Extract of Nux Vomica*.

Nux Vomica—*Fineness of Powder*.—Mr. R. Rother observes that before the process of percolation became general rasped nux vomica was almost wholly used and treated by maceration. For purposes of percolation a fine powder came in vogue, which, however, was much finer than that officinally directed. Since, however, the Pharmacopœia has in successive editions insisted on a No. 60 powder, the tendency has grown towards furnishing that grade only. Of course, no pharmacist thinks of powdering nux vomica by the ordinary means, and therefore the powder is invariably purchased. Very likely the mills can produce the finest grades as readily or nearly so as the somewhat coarser. As the ordinary menstrua employed in extracting nux vomica do not exhaust even the finest grades of powder, and coarser correspondingly less so, it would seem highly expedient to produce only the very finest attainable powder.—Drugg. Cir., April 1886, 78.

Ignatia—*Assay of Commercial Samples*.—Mr. Silas M. Harrington has assayed three samples of ignatia, two of which were purchased in the powdered state, while the last one was powdered by the author. For the first sample Dragendorff's process was used: 15 gm. were boiled three times in succession with dilute sulphuric acid; the united decoctions, nearly neutralized with magnesia, were evaporated to a syrupy consistence, the residue mixed with 2.4 times its volume of alcohol, the filtrate evaporated to 30 cc., shaken with chloroform, and after this had been removed, rendered alkaline with ammonia, and repeatedly agitated with chloroform to extract the alkaloids; these were dried, weighed,

dissolved in hydrochloric acid, the solution evaporated, the salts weighed and then dissolved in water and titrated with potassio-mercuric iodide, when the weight of strychnine and brucine is calculated from the weight of the mixed alkaloids or of the salts.

The last two specimens were assayed by the process for preparing strychnine as given by the U. S. P., 1870, the brucine being separated from the mixed alkaloids by washing with diluted alcohol.

The following results were obtained :

No. 1	yielded	1.039	per cent.	strychnine	and	0.355	per cent.	brucine.
No. 2	"	1.125	"	"	"	0.41	"	"
No. 3	"	1.425	"	"	"	0.475	"	"

—Amer. Jour. Pharm., Jan. 1886, 14; from the author's thesis.

Guachamacá—*History, etc.*—Dr. Kobert gives the history of this plant, of which the following is an abstract:

Guachamacá was first mentioned in 1841 by A. Codazzi, in a geographical work, and erroneously referred to *Ryania coccinea*. In his "Scenes of South American Life" (1862), Ramon Paéz, who had not seen the plant, gave an account of its poisonous properties. R. de Grosourdy (1864), in his "Medico criollo botánico," described the plant under the name of *Guachamaca toxifera*, and having seen only bad specimens of flowers and no fruit, correctly referred it to the Apocynaceæ. In 1869 Ernst, of Caracas, procured a leafy branch and two small roots, which were experimented with by A. Frydensberg with the result that the branch was found to contain a potent poison, and the root to be not poisonous. Joseph Hooker then supposed the plant to be a species of *Prestonia*. The wood, leaves, flowers and fruit, which were exhibited at the Exposición de Centenario por la Sociedad Patriótica de San Fernando de Apure (1883), furnished the material from which Ernst (1884) determined the plant to be a *Malouetia*, and Hooker recognized it as *Malouetia nitida*, Spruce. Frydensberg (1882) ascertained that the aqueous extract of the bark used on animals, produced paralysis without apparently disturbing the sensibility. Carl Sachs, who had collected (1876) a quantity of the plant in Venezuela, subsequently determined that the action of the poison resembles that of curare, and after his death an alkaloid, *guachamacine*, was isolated by J. Schiffer (1883), which possesses the action of curare and closely resembles curarine, though probably not identical with it.

Kobert now directs attention to the difference in origin of the various kinds of curare as had been ascertained by Planchon, and that the best curare comes from the Orinoco and Rio Negro, where the guachamacá plant appears to be not scarce; also that the properties of the guachamacine indicate its identity with curarine, and he urges that the former be carefully studied, both chemically and physiologically.

The following botanical description is condensed from a pamphlet by A. Ernst (Caracas, 1885), from which also the above history is obtained. Guachamacá is a shrub 4 or 5 meter shigh; bark rather thin, either ash-gray (guachamacá blanco) or dark colored (g. negro), longitudinally striate; wood yellowish white, branches opposite, the bark with numerous small white lenticels. Leaves simple, entire, short-petiolate, elliptic-lanceolate, narrowed below, sharp pointed, apple-green and glossy above, paler beneath, 10 or 12 cm. long, 3 or 4 cm. broad, the nerves forming near the margin a curved line, the bases of the opposite petioles almost united by broad membranous false stipules, which are caducous, and leave a transverse scar. Flowers in axillary groups; calyx five-parted, membranous on the margin, the divisions triangular and scarcely acute; corolla salver-shaped, yellowish, exceeding the calyx, the tube about 1 cm. long, the limb five-parted, and on the inner side white hairy; stamens 5, inserted in the throat, the anthers connivent. Ovary round, with a slight furrow, hairy above and surrounded by a nectary of 5 rather large glands. Style filiform, the glandular stigma projecting from the anthers. Follicle round, dehiscent by the ventral suture, 15 or 16 cm. long, 5 or 6 mm. thick, striate, dark gray. Seeds 7 or 8, nearly cylindrical, obliquely truncate, with a longitudinal furrow, about 2 cm. long, gray, not hairy, the endosperm thin and adhering to the testa; radicle superior, about 2 mm. long; cotyledons elliptic, 10 to 12 mm. long, adhering above.—Amer. Jour. Pharm., Nov. 1885, 560-562; from Pharm. Ztg., 1885, No. 51.

Holarrhena (Wrightia) *Antidysenterica*—*Analysis of the Seeds, etc.*—The bark of *Wrightia antidysenterica*, which was formerly introduced into Europe from India under the name of "Conessi bark," "Tellicherri bark," and "codāga pala," though it maintains its reputation and use as a remedy in diarrhoea, dysentery and fever, has failed to establish its reputation in the Western Materia Medica. It is thought that this is due to the fact that the comparatively inert bark of *Wrightia tinctoria* has been substituted or compounded with the bark under consideration, and the opinion is still maintained that the bark of *Wrightia antidysenterica*, which is mentioned under the synonym *Holarrhena antidysenterica* in the India Pharmacopœia, is really a valuable remedial agent. The bark has been analyzed by Dr. Stenhouse (in 1864) and shortly afterward by Prof. Haines, of Bombay, both of whom separated an alkaloid, which they respectively named *wrightine* and *conessine*. The seeds have now also been subjected to investigation by Mr. Warnecke, who has obtained from them a crystalline alkaloid which is described as occurring in delicate, colorless, anhydrous needles, having a bitter taste, becoming yellow at 60° to 70° C., melting at 122° C., and readily forming salts, the hydrochlorate being crystalline. The alkaloid, which the author prefers to call "Wrightine," is with difficulty soluble in water, but freely soluble

in alcohol, ether, chloroform, petroleum spirit, benzol, amyl alcohol, and bisulphide of carbon. It is remarkable in that, being a crystalline solid, it contains no oxygen, its formula being given as $C_{11}H_7N$.—Phar. Jour. and Trans., Feb. 27, 1886, 721-722; Ber. d. D. Chem. Ges., xix, 60.

Holarrhena africana, D. C.—*Occurrence of an Alkaloid in the Bark*.—Messrs. Polstorff and Schirmer communicate the results of a chemical examination of a bark forwarded from tropical Africa by German missionaries as a remedy against dysentery, and referred to *Holarrhena africana*, D. C. They have isolated from the bark an alkaloid ($\frac{1}{10}$ of 1 %), that they consider identical with that separated from East Indian conessi bark, and they attribute to it characters closely resembling those described by Mr. Warnecke as pertaining to the alkaloid obtained by him from the seeds of *Wrightia antidysenterica*. Like that alkaloid also, though crystallizable, it contains no oxygen, the formula being represented by $C_{12}H_{20}N$. The authors have prepared and describe several salts of the alkaloid. In view of the difference in the elementary composition of this and Warnecke's alkaloid, as well as that of Haines, from the bark of *Wrightia antidysenterica* (which is given as $C_{25}H_{21}NO$ old notation), it appears desirable that further investigation be made, and that the same be extended to both bark and seeds.—Phar. Jour. and Trans., Feb. 27, 1886, 722; Ber. d. D. Chem. Ges., xix., 78.

Parameria vulneraria, Radlkofer—*Proximate Examination, etc.*—Dr. Paul Zipperer draws attention to *Parameria vulneraria*, the plant from which the so-called

Balsamo de Taguloway of the native of the Malayan Archipelago is obtained. The balsam is obtained from the bark of the root and twigs, a description of which is given in the present paper, together with a result of the chemical examination. The bark yields 13.96 % of ash, containing beside chlorine, phosphoric acid, sulphuric acid, lime and magnesia, appreciable quantities of antimony. The author accounts for the presence of the latter from the circumstance that the bark was wrapped by the Chinese merchants in metallic paper. Owing to the presence of caoutchouc in the bark, it is difficult to pulverize. By appropriate treatment the author separates 8.5 % caoutchouc and 3 % of resin soluble in alcohol.—Arch. d. Pharm., Nov. (1) 1885, 817-823.

SAPOTACEÆ.

Bassia latifolia, Roxburgh—*Proximate Examination of the Flowers*.—Malwah flowers having been recommended as food for animals, Prof. Church (*Gardeners' Chronicle*, Jan. 16, 1886) has submitted them to an examination, which indicated in the air-dry flowers the presence of 52.8 per cent. of glucose, 3.2 per cent. sucrose, and only 2.2 per cent.

of nitrogen. While thus deficient as a nitrogenous food, they seem to be adapted for the production of alcohol, and are said to be largely used in France for this purpose.

STYRACEÆ.

Storax—History.—In his interesting work on “China and the Roman Orient,” Dr. Hirth draws attention to the fact that storax was known to the Chinese as early as the third century, if not two centuries earlier. Dr. Hirth’s observations are furthermore interesting, because they confirm the accuracy of Mr. Daniel Harburg’s notes on storax in connection with the route by which this article is brought to China. The substance believed to be storax is referred to in ancient Chinese works under the name of *su-ho*, and the *su-ho-yu* of the present day is undoubtedly storax, an article referred to in the Customs Tariffs as “Rose Muloes.” Translations of the passages in ancient Chinese records, referring to this substance, are given in Dr. Hirth’s work, and reproduced in the abstract in Pharm. Jour. and Trans., Oct. 17, 1885, 329.

ERICACEÆ.

Vaccinium Vitis-Idæa, Lin.—*Occurrence of Arbutin in the Plant.*—In 1870 Mr. Edo Claassen had announced the existence of a bitter principle, vacciniin, in the leaves (resp. the whole plant) of the

Cowberry, and described the preparation of the same, as well as some of its properties. He has now re-examined the bitter substance, and finds it to be identical with

Arbutin from *Arbutus Uva ursi*, a specimen of the latter having been prepared by him for comparison. The identity is complete, not alone in their crystalline shape, their solubilities and taste, but also in their reaction with the reagents enumerated by the author. The author draws attention to the importance of avoiding the presence of free acid in evaporating liquids containing arbutin, during its preparation, the principle being decomposed in the presence of either sulphuric, hydrochloric, citric or acetic acids. In order, therefore, to collect the whole amount of arbutin present, it is necessary, after having precipitated the decoction of the leaves by basic acetate of lead, and the filtrate by sulphhydric acid, to neutralize the free acetic acid with calcium or magnesium carbonate. The author has also made some experiments to determine the source of the bitterness observed in the fruit of the American cranberry.

V. macrocarpon.—He has so far failed to isolate the bitter substance, probably on account of the small percentage present, but if the blue color formed in liquids by ammonia and phospho-molybdic acid is, as has been suggested, characteristic of the presence of arbutin, there can be no doubt that the bitterness of cranberries is due to that principle.—Amer. Jour. Phar., July 1885, 321-323.

LOBELIACEÆ.

Lobelia inflata and *L. nicotianifolia*.—*Alkaloidal Constituents*.—Mr. v. Rosen has subjected *Lobelia nicotianifolia*, a plant growing in the mountain ranges of the Madras peninsula and Ceylon, to chemical examination, and succeeded in isolating two alkaloids, the one liquid and identical with the lobeline from *L. inflata*, the other a crystalline solid, soluble in chloroform and difficultly soluble in water, the chemical properties of which are being investigated. The results with the Asiatic plant led the author to extend his investigation to *L. inflata*, from which he likewise succeeded to isolate a liquid and a solid base. The pharmacological experiments made, show the corresponding alkaloids from the two plants to be identical.—Phar. Jour. and Trans., April 3, 1886, 838.

Lobelia Delisseana.—*Medicinal Value and Uses*.—Dr. Crescentio Garcia strongly recommends this species of *Lobelia*, which grows abundantly in Mexico, and is sometimes called "Vegetable Kermes," from the similarity of its action to that of antimonials, as superior to *L. inflata*. He says that it has been used for twenty years by several practitioners of Guadalajara, in the form of tincture of the root, in nervous affections of the chest, and in severe cough and asthma, with excellent results. He has himself used it with great success in bronchitis, asthma, whooping cough, and particularly in pneumonia. The root is ligneous, simple, tomentose, and nearly all the same thickness throughout, with a few slender radicles. The cortex is of a yellowish red, the interior being white. There is no smell, but when the root is pulverized it is sternutatory. When chewed it is at first sweetish, but soon changes to a bitter, sickly taste.—Pharm. Jour. and Trans., June 26, 1886, 1085; from La Voz de Hipocrates, April 1886.

COMPOSITÆ.

Anthemis Cotula, Linné.—*Chemical Examination, etc.*—Mr. George Edward Hurd has subjected the plant to chemical examination, but devoted particular attention to the volatile oil, determining only incidentally the presence of the crystallizable acid (anthemic acid) and of the crystallizable alkaloid (antheme) previously determined by Pattone (see Am. Jour. Pharm., 1859, 470). The volatile oil was obtained both from the fresh flowers and from the whole fresh plant, and was obtainable in both instances only by repeatedly distilling fresh material with the same water, and afterwards abstracting the oil from the aqueous distillate of ether. In this way the flower yielded about .013 % of a deep straw-colored or brown oil, whilst the herb yielded about .01 % of oil, a trifle more reddish in color, but otherwise identical. The oil seemed to be partially decomposed by continually redistilling the distillate with more of the plant, in the above manner; for the distillate possessed a disagreeable smell, differing somewhat from that of the oil when pure and dry, and had a decided acid reaction.

The oil thus obtained possessed a strong ethereal odor, somewhat resembling that of the plant, a bitter, acid taste, an acid reaction, and the sp. gr. 0.858 at 26° C. A portion of the oil was distilled alone, when about 30 per cent. came over between 120° and 200° C., about 30 per cent. from 200° to 280° C., the remainder decomposing at this point, leaving about 40 per cent. as a black, tarry residue. A saponification of the oil was then made, using the process adopted by Fittig in his analysis of the oil of *Anthemis nobilis* ("Annalen der Chemie," 195, p. 79). He thus obtained two distillates, the one amounting to about 30 per cent. of the oil used, oily in its character, and apparently composed of alcoholic and resinous bodies. The second portion yielded a crystalline acid, which was purified with difficulty. Relatively large amounts of the same acid crystallized also on exposing the oil to a temperature of about 10° C.—*Amer. Jour. Phar.*, Aug. 1885, 376-380.

Referring to the above results, Dr. F. L. Slocum observes that the microscopical examination shows enough oil cells to warrant a much larger yield of oil than was obtained by Mr. Hurd, and that a much larger amount of oil is present is proved by the easy decomposition of the oil, and the polymerization of the acid. The condensation of the acid into resin occurs so easily that in order to make a thorough examination over four tons of the plant would have to be distilled. The oil even decomposes by distilling the plant, as shown by its acid reaction, it undoubtedly being a neutral ether at first. The acid is an unsaturated acid, closely allied to angelic and tiglinic acids ($C_5H_8O_2$). It combines with HBr directly to a bromine compound. It decomposes into valerianic acid by gently warming its calcium salt, or heating it with HI and red phosphorus, similar to angelic acid ("Asher, Ber.," 2, p. 685), also by distilling the oil with dilute H_2SO_4 it passes into valerianic acid, as shown by Warner, who supposed the plant really contained valerianic acid, but in reality this acid was only a decomposition product. However, these reactions show that the acid obtained is isomeric with angelic acid.

The alcohols obtained were saturated alcohols, as proven by Mr. Hurd's experiments. Apparently a large portion of them was hexyl-alcohol, $C_6H_{14}O$. The highest boiling portion resembled Fittig's anthemol ("Annalen," vol. 195, p. 104). The alcohols below hexyl-alcohol are present in very minute quantities if present at all. It is much to be regretted that enough of the oil could not be obtained so that definite quantitative results could have been given; but the results, as far as ascertained by Mr. Hurd, conclusively prove that the oil of *A. cotula* is a compound ether very closely allied to the oil of *A. nobilis*, hence proving its close family connection and showing it to be a compound ether composed of the same series of acids and alcohols. In fact the compounds of the oils are so nearly identical that the relation of the plants could be identified by an examination of the oils alone.—*Ibid.*, 381.

Artemisia.—Alleged occurrence of *cinchona alkaloids* in plants of this genus. See under "Organic Chemistry."

Santonica.—*Yield of Santonin at Different Periods of Growth*.—Prof. Flückiger has had opportunity to examine wormseed, cultivated at Tschimkent, in Turkestan, and determined the amount of santonin yielded by the plant at different periods of its growth. Mr. Ehlinger, who made the examination, found that plants collected in May yielded 0.151 per cent. of santonin; in June, plants injured by wind, 0.396 per cent., and good plants, 0.470 per cent.; at the beginning of July, 1.006 per cent.; at the end of July, 1.315 per cent.; in August, 1.141 per cent.; in September—flowered plants—none. Both the flower-buds and leafy tops were used in the experiment. No santonin was found in the roots of sound plants collected in June. The method of the experiment is given.—Pharm. Jour. and Trans., Oct. 31, 1885, 266; Pharm. Post, Oct. 1885, 1128.

Helianthus tuberosus.—*Use for the Production of Alcohol*.—According to a note in the "Journal of Forestry," the roots of the Jerusalem or sunflower artichoke are now being used in Belgium as raw material for the production of alcohol, which they yield to the extent of 8 per cent. More than 3500 acres of poor, almost waste land will this year be cropped with the plant near Antwerp. The residue is used as cattle feed.—Gard. Chron., Aug. 8, 1885, 175; Phar. Jour. and Trans., Aug. 29, 1885, 188.

Russian Lactucarium.—*Examination*.—Mr. L. Schiperovitch has subjected Russian lactucarium to examination in order to determine whether it also contains the essential active principles, lactucerin and lactucin, found in other lactucaria.

Warm petroleum ether extracted 55 per cent. of the crude material. The extract recrystallized from alcohol, separated in the form of warts. The crystals melt at 210° C., are readily soluble in ether and chloroform, and free from odor and taste. These properties show that the substance extracted by the petroleum ether is lactucerin.

Lactucin was prepared by repeatedly extracting a definite quantity of lactucarium with boiling water, and allowing the solutions to stand for 3-4 days. The precipitate which had then formed was collected on a filter, washed with cold water, and then with hot water, as long as the filtrate acquired a bitter taste. On evaporating these extracts on a water bath a brown resinous mass was obtained which was again treated with boiling water. The solution was filtered off and precipitated with plumbic acetate, after which the lead precipitate was removed and the solution freed from lead with sulphuretted hydrogen. The filtrate was again evaporated, and the lactucin recrystallized from alcohol. Before purification by recrystallization, the lactucin was equal to 0.5 per cent.

of the lactucarium employed. Lactucin crystallizes in small leaves or rhombic plates, having a pearly lustre. When heated with concentrated sulphuric acid it is colored cherry red, with concentrated hydrochloric acid reddish yellow. Caustic alkalies produce a cherry red coloration of the aqueous solution.

An estimation of mannite gave 0.25 per cent., while the ash was found to be 7.0 per cent.—*Drugg. Circ.*, March 1886, 60; from *Phar. Zeitsch.* f. Russl.

Ambrosia artemisiifolia, Lin.—*Hæmostatic Properties*.—Attention has been directed to this common plant, known as ragweed, in the *North Car. Med. Jour.*, by Dr. J. H. Hill, who found it very serviceable in persistent bleeding of the nose, a strong infusion of the plant being given in tablespoonful doses every half-hour, and a plug made of the leaves being inserted into the nostril. According to the National Dispensatory, the astringency of the plant has caused it to be used in moderate discharges of blood and mucus, and to palliate mercurial salivation.—*Amer. Jour. Phar.*, June 1886, 300.

Grindelia robusta—*Physiological Action*.—Dr. Dobroklonsky has been engaged in studying the action of the fluid extract of *Grindelia robusta* clinically and physiologically. He reports that he has found it to have a great effect on the heart, causing it to beat more slowly and more regularly, but in this resembling digitalis, being more effectual than the better known drug for these purposes. It has also a more powerful influence on the heart than *Adonis vernalis* or *Convallaria majalis*. As to the diuretic effect of *Grindelia robusta*, the author finds that it is not very great.—*Phar. Jour. and Trans.*, May 1, 1886, 919.

Grindelia robusta, Nutt.—*Value as a Topical Application for the Sting of Insects*.—Dr. Gatchell recommends *Grindelia robusta* as a topical application in the treatment of stings and bites of insects. A lotion prepared with it is stated to stop the itching and promote the healing of the mosquito or flea bites.—*Amer. Jour. Pharm.*, Nov. 1885, 559.

Insect Powder—Toxic Effect.—A writer in "*Chem. and Drugg.*" makes the following observations respecting the action of insect powder upon the insects. "The fact should be kept in mind that the lungs or breathing apparatus of the insect are very different to those of the vertebrate animal. Instead of lungs, as we have, set apart in one portion of the frame, for the definite object of supplying oxygen to the blood after the latter has become in need of it, the insect has a central tube, connected with the air by a row of orifices on each side of its body, from which smaller channels radiate to every part of its circulation. The animal lung demands two systems, as it were, of circulation, the arterial and the venous. The insect has but a single circulation, and the whole of its blood is being constantly and fully brought into contact with fresh sup-

plies of air. Hence the instant and powerful effect of any toxic substance with which the air may be impregnated. Thus an insect may be almost instantly killed by the vapor of chloroform or ether or prussic acid. These facts are powerful arguments for the theory that it is the volatile constituents of insect powder which are fatal, and not the actual contact, necessarily, of its particles."

Piscidia Erythrina—*Review of the History and Properties of the Plant*.—An interesting review of the history, botanical character, proximate constituents, properties and uses of Jamaica dogwood has recently appeared in *Progrès Pharmaceutique*, which, as reproduced in "Der Fortschritt" (Feb. 5, 1886,) will be found in *Pharm. Jour. and Trans.*, May 29, 1886, 1014.

Sonchus oleraceus—*Amount of Caoutchouc present in the Milky Juice of the Plant*.—Mr. G. Kassner has determined the amount of caoutchouc in the milky juice of *Sonchus oleraceus*. The plant was exhausted with bisulphide of carbon, the bisulphide was distilled off, and the residue treated with boiling alcohol. In this manner 0.41 per cent. of crude caoutchouc was obtained, which on further treatment with alcoholic potash and hot dilute alcohol, for the removal of waxy and fatty matters, was reduced to 0.16 per cent. of pure caoutchouc.—*Pharm. Jour. and Trans.*, June 26, 1886, 1086; *L'Union Pharm.*, June 1886, 251.

Parthenium Hysterophorus—*Complex composition of its active constituent, Parthenine*.—Attempts made to separate the alkaloid "parthenine" described by Dr. Torar as the active constituent of *Parthenium Hysterophorus* (see *Proceedings* 1885, 138,) have been unsuccessful. Recent experiments of Mr. Guyet lead him to the conclusion that "parthenine" is not a definite body, but a complex substance, comparable to scillitine or the amorphous digitaline. It occurs in an amorphous form, or in black shining scales, very soluble in water. The solution is coffee-colored, and without being agreeable does not provoke much repugnance. It is given frequently in small doses, the total daily dose amounting to from 20 centigrams to one gram. The author states that he has found it decidedly efficacious against neuralgia, both intermittent and non-intermittent, and especially in cranial neuralgia. On the other hand, notwithstanding that the plant is used in the Antilles as a substitute for quinine, the author has found "parthenine" to be utterly without effect as an antipyretic.—*Pharm. Jour. and Trans.*, June 26, 1886; *Gaz. Méd.*, May 29, 1886, 259.

Santolina Chamæcyparissus—*Vermifuge Value*.—Mr. T. Maben draws attention to this plant, which has, in certain quarters, received considerable prominence as a valuable remedy for worms. There has hitherto been great difficulty in procuring the herb through the usual trade channels, and it was this difficulty that induced the author to direct the atten-

tion of the Conference to the subject. The plant was formerly much esteemed for its medicinal properties, but it had fallen almost entirely into disuse, and the credit of restoring its popularity belongs to the Rev. Dr. Kirk, of Edinburgh. The author gives the description of the plant as found in the "Treasury of Botany." He states that the decoction has been successfully used in the treatment for small worms. It is made of the strength of $\frac{1}{2}$ ounce to 1 pint, being boiled for half an hour. A partial proximate analysis gave the following results :

Soluble in Petroleum Ether—	Per cent.
Fixed oil	1.5
Soluble in alcohol—	
Resin, tannin, chlorophyll, and bitter principle	12.5
Soluble in water—	
Saccharine, amylose, and albuminoid matter	6.0
Cellulose, etc.	56.5
Ash	8.0
Moisture and volatile matter	15.5
	100.00

—Yearbook of Phar., 1885, 422-424.

Nabalus Albus, Hooker—*Description and Proximate Examination of the Root*.—This plant is known as white lettuce, lion's foot and rattlesnake root. The milky juice used internally and the leaves applied topically were formerly employed in bites of the rattlesnake, and a decoction of the root is used in domestic practice in dysentery and as a tonic. Mr. Neri B. Williams describes the root as being tuberous, from 1 to 6 inches long, $\frac{1}{2}$ to 1 inch thick, furnished with several rootlets, yellowish, internally white and emitting a milk-juice; after drying it breaks with a short fracture and is readily powdered; the odor is slight and peculiar, and the taste bitter.

A *tincture*, made with diluted alcohol, 4 oz. of the powdered root to the pint, was of a deep amber color, and was advantageously used by a physician in anemic diarrhœa, chronic dysentery, and in typhoid fever for its tonic and astringent properties; also topically in a case of pruritus ani.

A proximate analysis of the root showed the presence of tannin, gum, extractive, coloring matter, waxy matter and resins, partly soluble in ether. The ash amounted to about 12 per cent.—*Amer. Jour. Phar.*, March 1886, 117; from the author's thesis.

Tanghinia Venenifera—*Physiological Properties of the Seed*.—Mr. Ch. E. Quinquand has made investigation to determine the physiological properties of the

Ordeal Bean of Madagascar.—The principal feature consists in an increase of medullary reflectivity in animals; the respiration is at first ac-

celerated, then slower, and the animal dies from arrest of respiration, the heart continuing to beat. The poison has been administered to human beings for different diseases, and appears likely to be useful in toxic paralysis, palsy, and want of tone in the intestines. In two cases of nocturnal incontinence of urine it has proved of service. The symptoms for discontinuing its use are the appearance of headache and nausea, vomiting and a certain degree of feebleness.—Pharm. Jour. and Trans., Oct. 3, 1885, 288; from *Compt. Rend. cl.*, 534.

RUBIACEÆ.

Cinchona—Plantations in Java.—Mr. Henry B. Brady contributes an interesting account of a visit to the Government Cinchona Plantations in Java during the spring months of 1885, from which but brief abstracts can be made for this report. There are altogether eight government plantations, situated on the southern aspects of opposing ridges bordering the wide plain of Bandung, which is about 2000 feet above sea level. Four of these plantations are of about 200 acres each, two of 150 acres, one of 100, and one of 70 acres: one lying at an altitude of 6000 feet, four at about 5000, and the remainder somewhat lower. The author describes the method of cultivating, collecting and drying the bark, considers the different species under cultivation, the yield and comparative value of the bark, marks of distinction, etc., for all of which the paper must be consulted as published. A description of one of the most serious enemies to the cinchona plantations, a hemipterous insect—*Helopeltis Antonii*—the so-called “Assam tea-bug.” The insect punctures the leaf buds and very young leaves, and feeds upon the juices of the plant. The leaves shrivel and die, the growth of the shoots is stopped, and the tree, if not killed outright, becomes unhealthy and dwindles away. It has hitherto affected the plantations of *C. Calisaya*, *C. Ledgeriana* and *C. officinalis* particularly, those of *C. succirubra* remaining comparatively unscathed.—See Pharm. Jour. and Trans., Dec. 12, 1885, 485-490.

Cinchona Barks—Characters of the Commercial Supplies.—The editor of Pharm. Jour. and Trans., (Dec. 26, 1885,) makes some timely suggestions in reference to the selection of cinchona bark, for pharmaceutical use. He observes that the changes that have taken place during the last few years in the supply of cinchona bark deserve some consideration from pharmacists, who have hitherto been in the habit of purchasing cinchona bark more according to external appearance than any thing else. It has been pointed out that the characters which conventionally determine the market value of “druggists’ quills” are very often fallacious, and have no real connection with the quality of the bark. Thus, for instance, quills of renewed bark, being destitute of the appearance that has come to be regarded traditionally as an indication of good quality, will not sell for druggists’ purposes as well as quills of natural bark; though,

being in reality richer than the latter, they are readily bought by quinine manufacturers. A silvery coating on the epidermis of the bark is one of the points to which a fictitious importance is attached, and as an instance it is mentioned that a parcel of fine quills, having an intrinsic value of about three shillings per pound as a quinine-yielding bark, realized at a public sale as much as four shillings and ten pence, simply on account of the silvery coating upon the quills. In another instance two parcels of Darjeeling quills, that were almost identical according to analysis, sold respectively for four shillings and a penny and two shillings and three pence. The variability of succirubra bark, as regards the relative proportions of the several alkaloids it contains, is also a point of importance for pharmacists to bear in mind. The natural bark, whilst it may contain a total quantity of alkaloid corresponding to pharmacopœial requirements, is often deficient in quinine, which latter is present usually in superior quantities in the renewed bark and in the unsightly shavings. In the natural succirubra bark it is almost an invariable rule that cinchonidine is present in larger relative proportions than quinine; hence a bark containing between five and six per cent. of alkaloid, of which at least one-half is composed of cinchonidine and quinine, would, while containing only one per cent. of quinine, be within the requirements of the present Pharmacopœia (B. P.) definition.

Cinchona Barks—Assay.—Henry Brandner, Jr., Ph. G., obtained by the pharmacopœial process the following amounts of total alkaloids. Bark represented to be

Cinch. succirubra contained	7.78	per cent. moisture and yielded	3.50	per cent. alkaloids.
“ Calisaya, flat, “	8.02	“ “ “	2.14	“ “
“ “ quills, “	7.63	“ “ “	2.572	“ “

The test for quinine, as directed by the Pharmacopœia, gave negative results, and the solutions of the alkaloids yielded no characteristic color with chlorine water and ammonia, nor with chlorine water, potassium ferrocyanide and ammonia. The nature of the alkaloids was not ascertained.—*Amer. Jour. Pharm.*, Dec. 1885, 600.

Cinchona—De Vrij's Process of Assay.—The extended experience of Dr. J. E. De Vrij has taught him that *all* the alkaloids contained in cinchona bark can be completely extracted by treating the bark in fine powder with hydrochloric, nitric, or phosphoric acid, but that extraction cannot be completely effected by sulphuric acid. This has been disputed by some chemists, and by no one more strongly than by Dr. B. Paul, who stated at the evening meeting of the Pharmaceutical Society, held on December 3, 1884, as the result of recent investigations on various succirubra barks, that they retained nearly 50 per cent. of their alkaloids after extraction by hydrochloric acid. Dr. De Vrij now enters into a minute discussion of the treatment of cinchona bark by dilute acids, and

maintains that his former expressed opinion is correct, and particularly, that the hydrochloric acid process is by far the most suitable for pharmaceutical uses. It is simple, inexpensive, thoroughly reliable, and practically (if not scientifically) accurate. It is also capable of indicating not only the percentage of alkaloids, but also the proportion of cinchotannic acid, which is of no small importance from a therapeutical point of view.

The following directions will enable pharmacists to obtain satisfactory results with facility:

Twenty grammes of finely powdered bark are treated with hydrochloric acid and water as above described, whereby *all* the alkaloids are dissolved. The quantity of percolate which it is necessary to pass through the marc is usually from 180 cc. to 200 cc., which quantity will rarely be exceeded if the percolation has been successfully conducted. The estimation of the amount of alkaloids in this acid solution may be made in either of the following ways, viz:

1. The acid solution is precipitated by a *large excess* of caustic soda, which throws down a curd-like *white* precipitate. The precipitate is collected on a double filter, and washed until the filtrate is nearly colorless. The whole of the filtrate is measured, and compensation made by adding to the weight of alkaloid, to be presently ascertained, 0.0585 gramme for every 100 cc. of the mother-liquor at temperature 15° C. The drained filter is carefully dried upon blotting-paper until the precipitate ceases to adhere, when it may be easily detached without loss, and transferred to a small tared dish. It is now dried over a water-bath until it ceases to lose weight, and the weight is ascertained. Add the compensation above indicated for mother-liquor, multiply the sum by five, and the product is the percentage of alkaloids in the bark under examination.

The alkaline mother-liquor may now be used for ascertaining indirectly the percentage of cinchotannic acid. After exposure for two or three days in a shallow dish, by which the cinchotannic acid becomes converted into cinchona red, the liquid is heated, and hydrochloric acid cautiously added to slight acid reaction. After cooling, the now turbid liquor is filtered through a double filter to collect the very voluminous precipitate of cinchona red. The precipitate is washed, dried, and weighed, the second filter being used as a tare. By multiplying the ascertained weight of cinchona red by 1.2, a close approximation to the weight of cinchotannic acid is obtained, from which its percentage may be calculated, and it will be seen that the quantity of cinchotannic acid in different species of cinchona, and even in different samples of the same species, varies considerably.

2. The acid solution is mixed with excess of caustic soda as before, and well shaken in a bottle with 1 litre of commercial benzol, and left standing for not more than five minutes, for the benzol, which now contains

the alkaloids in solution, to separate. The benzol solution is now decanted on a filter previously moistened with benzol, and the remainder is poured into a separating funnel. After sufficient time for separation, the red alkaline liquor is drawn off into the bottle previously used, and shaken with other 200 cc. benzol to remove possible traces of alkaloid, and this benzolic solution is also filtered and added to the former. The amount of alkaloids contained in the mixed benzolic solutions may now be determined either directly or indirectly in the manner following, viz :

The benzolic solution is shaken with 30 cc. very dilute nitric acid, the acid solution is drawn off and replaced by 20 cc. water, which is again shaken and added to the first. The liquors are heated to drive off traces of benzol, and when cool transferred to a separator and shaken with 200 cc. ether and an excess of caustic soda. In this way *all* the alkaloids are dissolved by the ether, leaving generally a slight brown film on the surface of the alkaline liquor, *which is almost entirely soluble in chloroform*. After separating the ethereal solution, a further 100 cc. ether is shaken with the alkaline liquor, and is then added to the first. By distillation of the ether, the whole of the alkaloids are left in a state of greater purity than the author has ever obtained them by any other process.

The benzolic solution is well shaken with 70 cc. deci-normal sulphuric acid. The acid solution is drawn off and replaced by 30 cc. water, which is again shaken and added to the other. The aqueous liquors are heated, and *accurately* neutralized by deci-normal solution of caustic soda until the color of reddened litmus is affected by it. The quantity of soda solution required for saturation is now to be deducted from 70 cc. (the equivalent of 70 cc. deci-normal sulphuric acid), and the difference multiplied by .031³ is the weight of alkaloid in 20 grammes bark. This product multiplied by 5 gives the percentage.

In concluding his paper the author submits the following comparison of results obtained in the analysis of a sample of bark by the hydrochloric acid process and by other processes of recognized accuracy, these analyses having been made by Mr. A. Kissel, Chemical Assistant to Dr. G. Kerner, in Zimmer's quinine manufactory:

	Lime and Alcohol Process.	Lime and Oil Process.	Hydrochloric Acid Process.
Quinine	1.805	1.798	1.802
Quinidine	0.358	0.347	0.351
Cinchonidine	0.338	0.343	0.335
Amorphous	1.873	1.867	1.874
Total	4.374	4.355	4.362

—Amer. Jour. Pharm., Dec. 1885, 622-629; Chem. and Drugg., Aug. 15, 1885.

Rio Ipecacuanha—*Botanical Source*.—This drug being usually referred

to *Ionidium Ipecacuanha*, Vent., Mr. William Kirkby was requested to subject it to microscopical comparison with some authentic specimens of the root of *I. Ipecacuanha*, since the drug did not altogether agree with the latter. The microscopical differences are as follows: The root of *I. Ipecacuanha* exhibits on a transverse section a thin brown epidermal layer surrounding a thick band of cortical parenchyma; within this is a vascular cylinder composed of pitted vessels and xylem fibres. There are no parenchymatous rays in the woody column. A section of the Rio ipecacuanha (?) differs from the above in several important particulars. It consists of a cortex and a xylem column. In the cortical portion are formed large wedge-shaped groups of sclerenchymatous cells, the apices of the wedges being directed towards the circumference. The woody center is traversed by medullary rays, some of them being rather broad; the vessels are somewhat smaller than in *I. Ipecacuanha*. It is, therefore, evident that this so-called Rio ipecacuanha is not the root of *I. ipecacuanha*. Mr. J. B. Barnes, jun., some time ago (*Pharm. Jour. and Trans.*, (3) xv., 515,) stated that, having made a chemical and physiological examination of the root of *I. Ipecacuanha*, he had failed to confirm previous analyses, which give emetine as one of its constituents, and he considered that his physiological experiments disproved the statements that had been made with regard to its reputed emetic properties. In the light of Mr. Kirkby's experiments, it seems probable that he had not been operating with the roots of *I. Ipecacuanha*, but with the drug under present consideration.—*Pharm. Jour. and Trans.*, Aug. 8, 1885, 126.

Ipecac—Methods of Assay and Process for the Preparation of Emetine.
—Dr. A. B. Lyons reviews the processes that have been proposed for the preparation of emetine, and also the different methods for the assay of ipecac in use. Of the different processes for preparing emetine, the author selects that of Podwissotzky (see *Proceedings* 1880, 338) as the best, but suggests some simplification and improvements, as follows: Mix 10 parts of the powdered ipecacuanha in a flask, or other suitable container, with an equal weight of petroleum benzin. Add a mixture of two parts of stronger water of ammonia with eight parts of alcohol; shake the mixture well, and allow it to stand a short time in a warm place. Proceed to extract the alkaloid by boiling with successive portions of petroleum benzin, amounting in all to ten or fifteen times the weight of the drug. Filter the benzin solution while hot through paper, and treat it with water containing sulphuric acid, which readily removes the whole of the alkaloid, leaving resinous matter in the benzin. Separate the acid solution, filter if necessary to remove suspended matter, add excess of alkali (carbonate of barium, carbonate of sodium, or ammonia) and take up the alkaloid with boiling petroleum benzin, as recommended by Podwissotzky. Dr. Lyons believes that by this method it is practicable to extract from ipecacuanha of good quality not less than two per cent. of alkaloid. The

solvent used, although employed in large quantity, is a very cheap one, and the loss in manufacturing operations would be a trifling item of expense, as compared with that involved in the use of the more expensive solvents, such as alcohol, ether or chloroform. The process, moreover, is one which can easily be employed as an assay process, which is not true of any of those previously passed in review. Its advantages for this purpose are its simplicity of execution, and the rapidity with which it can be carried out. It does not completely exhaust the drug, although it permits us to extract a larger proportion of the alkaloid than any other rapid method he has tried. By using a portion of chloroform in connection with the benzin, as recommended in the assay process below, the process may be made to yield reasonably satisfactory results.

Of the methods that have been proposed for the assay of ipecac, the author considers that of Zinoffsky (recommended by Dragendorff in his *Werthbestimmung einiger starkwirkender Drogen*), the only one worthy of consideration, and he has obtained excellent results by a slight modification of that process, which he describes in the present paper. The process is, however, not adapted to the extraction of the whole of the emetine in weighable form. For this purpose the most suitable solvent is that employed by Prollius for the assay of cinchona bark (see *Proceedings* 1884, 163), which consists of a mixture of 250 p. ether, 20 p. absolute alcohol, and 10 p. stronger ammonia. As applied to the assay of ipecac the method would be as follows: Place in a small flask (capacity about 50 cc.) $2\frac{1}{2}$ grams, accurately weighed, of ipecac in fine powder; select a sound cork to fit the flask, and weigh flask and cork with the contained ipecac. Fill the flask nearly full with the mixture of ether, ammonia, and alcohol, and set aside, shaking occasionally, for twenty-four hours. Weigh the flask with its contents before removing the cork; decant as much of the clear fluid as practicable, taking care to operate rapidly to avoid evaporation. Immediately cork the flask again and weigh. The alkaloid may now be separated from the decanted portion of ether by shaking repeatedly with acid water, and again washing out from the aqueous solution, rendered alkaline, with chloroform; but identical results can be obtained more rapidly by merely evaporating the ether after addition of water containing 10 minims of 6 per cent. sulphuric acid, and titrating the aqueous solution (made up to 20 cc.) with Mayer's reagent.

The results obtained by this method of assay have, however, been unsatisfactorily low, and the author only regards the method as one that promises well when the details are further worked out. Experiments made with chloroform as a solvent have given the best results yet obtained. One plan, which is both simple and rapid, is the following: Place in a flask 5 grams of finely-powdered ipecac, add a mixture of strong ammonia 1 gram, alcohol 5 grams, chloroform 30 grams. Set in

a warm place half an hour, then apply sufficient heat to keep the mixture boiling for one hour; then add 50 cc. petroleum-benzin, boil half an hour, add benzin enough to make the mixture measure nearly 100 cc., filter, and add through the filter enough benzin to make 100 cc. Of this take for the assay 25 cc., and treat as in the ammoniated ether process.

Dr. Lyons concludes his paper by a summary of the results of assays he had occasion to make of ipecac and its preparations, observing that his results have been obtained, when not otherwise stated, by Dragendorff's method of assay.

Of 48 samples of crude drug examined, 5 contained less than 2 per cent. emetine (minimum 1.65 per cent.), 10 contained between 2 and 2.5 per cent., 23 between 2.5 per cent. and 3 per cent., and 10 upward of 3 per cent. The following items of description are noted in connection with some of the samples:

	Per cent.
Thin roots, nearly black	2.2
Flesh colored, "bold" sample	2.85
Flesh colored, good appearance	2.1
Thin, dark root.	1.65
"Bold" sample (white)	2.25
" "	2.75
Pale flesh color	3.00
White, bold, tender roots	2.7
" " woody.	2.6
Dark colored, much broken	2.8

Solid extract of ipecac has ranged in content of alkaloid from 8.9 to 10.3 per cent. Powdered extract, from 6 to 7.5 per cent. Fluid extracts made by the U. S. P. process contain generally less than 1.5 per cent. Made by processes that do not involve the use of heat, the percentage is higher, but does not generally exceed 2 to 2.25, and often falls short of this. The samples examined have been those of a number of manufacturing firms, and many of them are regarded as articles of excellent quality:—*Amer. Jour. Pharm.*, Nov. 1885, 531-542.

Ipecacuanha.—*Process of Assay*.—Professor Flückiger describes a process for the assay of ipecacuanha, which consists in exhausting 10 to 15 grams of the drug in very fine powder with boiling chloroform, to which a drop of solution of ammonia has been added. The extraction is continued until the chloroform passing through shows no sign of alkaloid when treated with acidulated water. Upon distilling off the chloroform, the emetine is left in a very pure condition, and may be dried at 100° C. and weighed, or perhaps more conveniently titrated with Mayer's reagent. The author states that in considerable experience he has not found the average quantity of emetine in ipecacuanha root to exceed 1 per cent., and he is therefore inclined to attribute considerably larger yields that

have been reported either to the emetine not having been obtained so pure, or to faults in the titration.—Pharm. Jour. and Trans., Jan. 30, 1886, 643; Pharm. Ztg., Jan. 13, 1886, 30.

Ipecac—Comparative Strength of Certain Preparations.—Mr. W. A. H. Naylor, considering it desirable to institute an inquiry into the alkaloidal value of the ipecac preparations in common use, selected for this purpose *Vinum Ipecacuanhæ*, B. P., *Extractum Ipecacuanhæ*, U. S. P., and *Acetum Ipecacuanhæ*. The preparations were all made from the same sample of finely powdered good commercial ipecac root; the first two in strict accordance with the respective Pharmacopœias; the last-named with diluted acetic acid, B. P., in proportion of 1:20. Wine and vinegar were also made from the same sample of ipecac which was simply bruised. The preparations were severally assayed by the process of Zinoffsky. The powdered bark was found to assay 1.09 per cent. alkaloid. The alkaloidal strength of the preparations is shown in the following:

FROM PORTION OF SAMPLE IPECAC IN No. 60 POWDER.

	No. c.c. taken.	Bark equivalent in grams.	Alkaloid equivalent to 100 grams of bark.
Vinum ipecac	400	20	0.756
Acetum ipecac	400	20	0.836
Ext. ipecac. fluid	40	40	0.720

FROM PORTION OF SAMPLE IPECAC, "BRUISED."

	No. c.c. taken.	Bark equivalent in grams.	Alkaloid equivalent to 100 grams of bark.
Vinum ipecac	400	20	0.604
Acetum ipecac	400	20	0.756

The results show the inferiority of the vinegar over the other preparations and the advisability of making the preparation from fine powder.—Year Book of Pharm., 1885, 497-499.

Galium Aparine, Lin.—*Medicinal Uses.*—This plant, commonly known as *cleavers* and *goosegrass* was formerly employed as a diuretic, in dropsy and in pectoral complaints. Recently Dr. T. R. Orwin ("Brit. Med. Jour."), reported its successful employment in a case of psoriasis, which had not yielded to chrysarobin, tar or arsenic. The plant was applied in the form of poultice, and was internally given in infusion.—Amer. Jour. Pharm., June 1886, 300.

Danaïa fragrans, Commerson.—Messrs. Heckel and Schlagdenhauffen have recently examined the root of this plant, which is a climbing shrub of Madagascar, is in great repute there as a vulnerary and antitherpetic, and is employed also as a tonic and antiperiodic. Their experiments have shown that Bourdon's supposed alkaloid danaidine is calcium sulphate; but they isolated a greenish-brown glucoside *danain*, which is soluble in

alcohol, acetone and hot water, and less freely soluble in chloroform, ether and cold water. It dyes fabrics, is precipitated by lead acetates, and seems to represent the medicinal properties of the root.—*Amer. Jour. Pharm.*, Feb. 1886, 91; from *Compt. Rend.*, ci., 955.

Roasted Coffee—Antiseptic Value.—Dr. Oppler highly recommends roasted coffee as an antiseptic dressing for wounds, for destroying the odor of twice or even four or five times its weight of iodoform, and for disguising the taste of castor-oil. These valuable effects are attributed to the charcoal and the aromatic decomposition products, formed during the roasting of coffee.—*Amer. Jour. Pharm.*, Feb. 1886, 92; from *Nouv. Remèdes*.

CAPRIFOLIACEÆ.

Viburnum Lentago—Proximate Analysis.—Mr. Henry Palmer has subjected the bark of the "sweet viburnum," commonly known under the name of

Viburnum prunifolium to proximate examination, and found it contains valerianic acid, a greenish resin, a brown bitter principle, tannin, sugar, fixed oil, saponin, gum and oxalate. For its extraction he recommends a menstruum containing from 60 to 70 per cent. of alcohol. *Proc. Mich. State Pharm. Assoc.*, 1885, 158-160.

UMBELLIFERÆ.

Pastinaca sativa—Non-Presence of a Poisonous Constituent.—Mr. Joseph T. Bennett records some experiments made with a view to determining the presence of a poisonous constituent in the wild growing common parsnip (*Pastinaca sativa*, Lin.), the roots, which on the authority of Dunglinson ("Medical Dictionary," ed. 1874, 826), possesses poisonous properties. The author's numerous experiments prove very conclusively that the roots of *Pastinaca sativa*, obtained from wild-growing plants, either do not possess the poisonous properties generally accorded to them, or that these properties are not manifested to the same degree upon the lower animals as with man. It is, moreover, possible that the roots, at different seasons, possess a varying physiological action; but perhaps still more probable, that at least some of the recorded cases of poisoning by the so-called "wild parsnip" may be referred to the roots of the "water parsnip," from a species of *Sium*, probably

Sium latifolium: this latter having, by Dr. C. B. White (U. S. A.) been described as possessing poisonous properties (*Amer. Jour. Pharm.*, 1813, 371), under the name of "wild parsnip," and was found by Mr. A. R. Porter (*Ibid*, 1876, 348), and Mr. N. Rogers (*Ibid*, 1876, 483), to contain a poisonous resin.—*Contrib. Dep. Pharm. Univ. Wisc.*, No. 2 (1886), 39-42.

In connection with the above, Professor F. B. Power draws attention to

an article recently, and quite independently, contributed by Dr. J. I. Brown in the "Sheboygan (Wis.) Times," in which he states that he has been so thoroughly convinced of the innocuousness of the wild-growing parsnip that he some time ago ate some roots from plants growing wild for many years in his neighborhood, for dinner. He could discover little or no difference either cooked or raw, between these parsnips that have run wild for about fifty years and those cultivated in his own garden.—*Ibid*, 43-44.

Myrrhis odorata—*Presence of Glycyrrhizin*.—The statement of E. Guignet that he has obtained glycyrrhizin from certain non-papilionaceous plants, has induced Dr. Schroeder to experiment in the same direction. Selecting *Myrrhis odorata*, a handsome umbelliferous plant, found in the Alps and in the higher mountainous regions of Southern Europe and Central Asia, he has succeeded in isolating a substance identical in all particulars with the glycyrrhizin from licorice. The plant has been known to yield a dark-brown, sweet-tasting extract, which is said to have been used as an adulterant of licorice extract.—*Arch. d. Pharm.*, Aug. (2) 1885, 621-622.

Ammi Visnaga, Lin.—*Medicinal Uses*.—This plant, which is indigenous to the countries near the Mediterranean, and more particularly the fruit, has long been in use, diuretic and emmenagogue properties being ascribed to it. The numerous rays of the umbels finally become quite hard, and possessing an aromatic flavor, are used in oriental countries as tooth-picks. The Arabian name of the plant is *el kellah*. Ibrahim Mustapha (*Compt. Rend.*, Aug. 25, 1879), isolated from the fruit an emetic and narcotic principle, which he named *kellin*; it is obtained by mixing the powdered fruit with slaked lime and alcohol, evaporating to dryness and exhausting with ether. Kellin forms white, silky needles, which are sparingly soluble in cold water. Recently attention has again been directed to this plant in French journals (*L'Union Méd.*, April 8, 1886). Kellin is stated to produce in animals paralysis of the hind legs, irregularity of the heart action, and slow breathing. An infusion of the fruit, 5 or 6:100, is used as a mouth wash in inflammations and carious teeth, and a decoction, 10:1000, is given internally for rheumatism, from 125 to 150 gm. being taken daily; an ointment made with the powdered fruit being used externally. The decoction is also stated to possess mild antipyretic properties, and to be useful in calculi of uric acid. The leaves, which are used for poultices, are decompound, the final lobes being linear, cuspidate and divaricate.—*Amer. Jour. Pharm.*, June 1886, 300.

RANUNCULACEÆ.

Ranunculaceous Plants—Volatile and Acrid Constituents.—Dr. Beckurts has contributed an interesting paper on the volatile and acrid constituents of various ranunculaceous plants at the Fifty-Eighth Assembly

of German Naturalists and Physicians. It has been long known that these plants yield an acrid distillate that separates after a time two compounds,

Anemonin and *Anemonic acid*, and thus loses its acidity. Dr. Beckurts, by distilling in a current of steam the finely divided plants of *Anemone nemorosa*, *A. pratensis*, *A. Pulsatilla*, *Ranunculus reptans*, *R. acer*, *Clematis angustifolia* and *C. integrifolia*, obtained in each case a colorless, clear distillate, with an acrid and burning taste, irritating to the nostrils, and neutral in reaction. From this distillate chloroform removed the acrid substance—

Anemone Camphor—which could then be isolated in very hard rhombic prisms, melting without decomposition at above 300° C., having a smell that was very irritating to the eyes and respiratory organs, and exercising a very strong vesicant action when applied to the skin. This camphor is very unstable, and in aqueous solution, or even in chloroform, undergoes decomposition, being split up into anemonin, a crystalline neutral body, melting at 151° C., and amorphous anemonic acid, insoluble in alcohol, water and ether, and forming colored amorphous salts. Anemonin is tasteless and odorless, slightly soluble in cold, more soluble in hot water and alcohol, as well as in chloroform, but not in ether. When treated with alkalies it is converted into

Anemoninic Acid, having the same composition as anemonic acid, but differing from it in several particulars. It is to the decomposition of anemone camphor that the author attributes the loss of acidity which these plants undergo while drying.—Phar. Jour. and Trans., Oct. 31, 1885.

Aconitum Fischeri, Reich.—*Examination of the Root*.—Prof. F. B. Power and Mr. Henry G. Ruenzel have determined the amount of alkaloid in a limited sample of the roots of *Aconitum Fischeri*, Reichenbach, also known under the synonyms of *A. nasutum*, Hooker, and *A. columbianum*, Nuttall, the particular sample under examination having been collected in Utah. By the gravimetric method of analysis, the authors determined the presence of 0.77 per cent. of alkaloid, whilst the volumetric method of Dragendorff indicated 1.61 per cent. A similar discrepancy has been previously observed in Prof. Dragendorff's own laboratory, and it seems therefore probable that the discrepancy is due to the presence of some other substances than alkaloids which are precipitated by the reagent.—Contrib. Dep. Pharm. Univ. Wisc., No. 1 (1885), 18–20.

Wakhma—*A Non-Poisonous Indian Aconite Tuber*.—Mr. T. Shimoyama draws attention to "wakhma," the tubers of a species of *Aconitum*, which, owing to their non-poisonous character, he considers possibly to be derived from the non-poisonous *Aconitum heterophyllum*. He has prepared an alkaloid from the tubers by stirring the fine powder with one-tenth its weight of slaked lime and water to a paste, drying, exhaust-

ing by boiling with alcohol (sp. gr., 834), distilling off the alcohol, treating residue with water acidulated with acetic acid, rendering filtrate alkaline, shaking out with ether. From the ether solution the alkaloid was again removed with water containing acetic acid, and from this in turn the liberated alkaloid of ether, and this alternation was repeated until the alkaloid was perfectly colorless. The alkaloid is not crystallizable, but its hydrochlorate and hydriodide are. Physiological experiments made by Dr. Kobert prove it to be as little toxic as the ateesine from *A. heterophyllum*, and the two alkaloids are evidently identical.—Phar. Jour. and Trans., July 25, 1885, 86; Arch. d. Pharm., July 1885, 495.

Hydrastis canadensis, Lin.—*Constituents of the Rhizome*.—Prof. Frederick B. Power has made some elaborate researches on the constituents of the rhizome of *Hydrastis canadensis*, and arrives at the following conclusions:

1. The only alkaloidal constituents of the rhizome of *H. canadensis* are berberine and hydrastine.

2. The fluorescence in solution of hydrastis, or products obtained therefrom, is due to the alkaloid hydrastine, and not to an independent fluorescent principle bearing any relation to æsculin.

3. The alkaloids berberine and hydrastine, when perfectly pure, afford no coloration with ferric salts.—Contrib. Dep. Pharm. Univ. Wisc., 55-61.

Hydrastis—*Removal of Coloring Matter, etc.*—According to Mr. John W. Newton, the coloring matter of hydrastis is precipitated from an aqueous infusion of the root by basic acetate of lead. After decomposing the precipitate by sulphuretted hydrogen, the coloring matter was again soluble in water, and this solution, which contained 5.90 per cent. of solid matter, did *not* dye cotton cloth, for which acetate of iron, ferric chloride, aluminium acetate, or potassium bichromate had been used as mordants. Subsequently, sodium carbonate and sulphuric acid were added in turn without altering the result.—Amer. Jour. Pharm., March 1886, 119; from the author's thesis.

Adonis vernalis—Preparation, etc., of the active constituent *Adonidin* which see under "Organic Chemistry."

Adonis cupaniana, Gussone—*Glucosidal constituent*.—Dr. Cerevello has found this species of *Adonis*, which abounds in the maritime districts of Sicily, to contain a glucoside quite analagous in its action as a heart poison to the *adonidin* from *A. vernalis*, and probably identical with that body. The glucoside, which appears to be present in all parts of the plant, was obtained by exhausting the flowering herb with 50% alcohol, precipitating with basic acetate of lead, filtering, evaporating, treating syrupy liquid with a strong solution of tannic acid and a few drops

of ammonia, washing precipitate on a filter with a little water, decomposing with oxide of zinc, and taking up with absolute alcohol, from which the pure substance was obtained by fractional precipitation with ether. The product was amorphous, colorless, bitter, insoluble in water, soluble in alcohol.—Ann. di Chim. Med.-Farmac., May 1885, 295; Pharm. Jour. and Trans., Aug. 1, 1885, 106.

Helletorus foetidus—*Medicinal use*.—According to Dr. F. Warner this plant is largely and successfully used in Somersetshire for inoculating cattle against anthrax, or splenic fever. The plant was formerly grown in gardens as an effective remedy for ground worms.—Pharm. Jour. and Trans., May 29, 1886, 1007.

Xanthorrhiza apiifolia, L'Heritier—*Proximate Analysis of the Rhizome*.—Mr. Samuel S. Jones has subjected the rhizome of this plant to proximate examination. It is interesting to note that, in addition to the berberine, the author obtained small quantities of a second alkaloid, which, however, requires nearer examination. The results of the proximate analysis are summarized as follows:

Soluble in petroleum spirit	.015	
Volatile oil		.009
Resin soluble in absolute alcohol		.006
Soluble in stronger ether	1.300	
Resin with traces of alkaloid		1.300
Soluble in absolute alcohol	1.320	
Resin soluble in chloroform, benzol, etc		.660
Alkaloids		.280
Other organic compounds		.300
Inorganic matter		.080
Soluble in distilled water	6.100	
Mucilage and albumen		.070
Dextrin, etc		.130
Glucose		.250
Saccharose		.990
Other organic matter		3.940
Inorganic matter		.720
Soluble in solution of sodium hydrate (.2 per cent.)	4.250	
Mucilage and albumen		2.190
Other organic matter		1.460
Inorganic matter		.600
Soluble in dilute hydrochloric acid (1 per cent.)	8.250	
Starch and other compounds		7.830
Inorganic matter		.420
Loss by treatment with chlorine water	12.345	12.345
Residue remaining	65.180	65.180
Loss	1.240	1.240
	100 —	100 —

—Amer. Jour. Pharm., April 1886, 161-162; from the author's thesis.

MAGNOLIACEÆ.

Liriodendron Tulipifera—*Preparation and Character of Yellow Coloring Matter from the Root Bark*.—Prof. J. U. Lloyd communicates the following respecting the preparation and character of the peculiar yellow coloring matter of the bark of *Liriodendron Tulipifera*, commonly known under the name of white or yellow poplar bark: Exhaust fresh bark of root of *Liriodendron tulipifera* with alcohol, add some water, and distil the alcohol. After some days filter the liquid and evaporate it to a semi-solid consistence, then incorporate this thoroughly with alcohol in considerable amount. Filter the alcohol from the extractive precipitate, and add an excess of ammonia water to the filtrate. The brownish-yellow precipitate is then to be washed with alcohol and dried by spreading it upon glass and exposing to the atmosphere. It forms brilliant deep brownish-red transparent scales that separate easily from the glass, and appear very much like dark-colored scales of citrate of iron. This substance dissolves slowly in water, producing a yellow liquid that is changed to a dark reddish-yellow by addition of an alkali. It dissolves readily in alkaline water. It is insoluble in alkaline alcohol or in benzol, chloroform and ether. Its color in alkaline aqueous solution is very much lightened by addition of excess of an acid. It combines neither with acid nor alkali, failing to neutralize either of them, and its precipitation from alcohol by addition of ammonia seems to be simply due to the fact that it is insoluble in such a menstruum. It is tasteless and is odorless; being of interest only from the fact that it is a characteristic coloring matter of this magnificent American tree.—Amer. Drugg., June 1886, 101.

Star Anise—*Cultivation, etc., in Annam*.—An interesting account of the cultivation of the star anise tree and the distillation of the oil in Annam is given in "Petit Moniteur de la Pharmacie" (July 1885). The tree is cultivated in the mountainous regions of Annam, and grows very slowly during the first ten years, attaining a height of about 3 meters. Up to that time it produces very little. From its tenth year its size and its production increase rapidly up to thirty or forty years, at which age the tree commences to fall off and die. A tree, ten to fifteen centimeters diameter, yields on an average 20 kilograms of fruit; a full-sized tree, with a diameter of forty or fifty centimeters, gives two hundred kilograms. The fruit is sold to the manufacturer of oil while green, and the collection is made by hand; the trees bear every two years. The Annamites sow the seed in manured soil. The young plants issue from the soil after about twenty or thirty days, and in two or three years they attain a height of twenty or thirty centimeters. They are then transplanted at a distance of five or six meters from each other, but always upon slopes free from stones, and never at the bottom of a ravine.

The distillation of oil is conducted as follows: Into a recipient, which is an iron pan about twenty-five centimeters in diameter, are placed ten kilograms of star anise and water, which quantity nearly fills it. A second iron pan, pierced with a circular opening about twenty-five or thirty centimeters in circumference, is placed upon the first so as to form a cover. Over the opening in this pan is placed an earthen vessel, having three small orifices in the lower part, which allow the access of vapor into the vessel; these orifices are covered, on the inside of the recipient, by small ear-shaped hoods that have for their object to throw the vapor upon the side of the vessel. Lastly, this earthen vessel is covered by an iron pan which performs the part of a refrigerant, and into which a continuous current of cold water is made to pass by means of a bamboo pipe, from a vat placed near the apparatus. The joints of the first two iron pans are tested with mastic, that of the earthen vessel with the refrigerant by means of rag bandages. The vapor reaching the earthen vessel is condensed when it strikes upon the bottom of the pan holding the cold water, and falls into a small circular trough running round the bottom of the vessel, from which it escapes through a small pipe. The small pipe opens out into a bamboo which conducts the products of distillation into a closed tinned vessel full of water, when the oil, rising to the top, drives out a corresponding quantity of water. A distillation lasts two days, and the yield from ten Annamite kilograms of star anise is ten and a half decilitres of oil. The residue of distillation is thrown away.—Phar. Jour. and Trans., July 25, 1885, 91-92.

Illicium anisatum.—*Proximate Examination of the Fruit*.—Mr. Carl E. Schlegel has subjected the fruit capsules, deprived of the seeds, to proximate examination. Air dry the powdered capsules lost 10.36% of moisture and volatile oil. The dry powder yielded on incineration 3.5 per cent. of ash, containing potassium, sodium, iron, aluminium and hydrochloric, sulphuric and phosphoric acids. The petroleum extraction yielded 4.675 per cent. of volatile, but no fixed oil. The author further obtained green wax, resin partly soluble in solution of potassa, gallic acid (probably), and saponin.—Amer. Jour. Pharm., Sept. 1885, 426-428.

BERBERIDACEÆ.

Podophyllum peltatum, Lin.—*Examination of the Leaves*.—Mr. Benjamin F. Carter has separated from the leaves of *Podophyllum peltatum* a resin, oily or soft in consistence, nearly odorless, bitter, completely soluble in alcohol, to the extent of 90% in ether, 86% in chloroform, 72% in carbon disulphide, 67% in benzol, and 40% in petroleum benzin; completely in alkaline aqueous solution; partially soluble in boiling water. Physiologically it is milder than the resin of the rhizome.—Contrib. Dep. Pharm. Univ. Mich., No. 21 (1886), 35-38.

MENISPERMACEÆ.

Calumba—*Physiological Activity of its Bitter Principle, Calumbin*, which see under "Organic Chemistry."

RUTACEÆ.

Jaborandi—*Alkaloidal Constituents and Derivatives*.—See *Alkaloids of Jaborandi*, under "Organic Chemistry."

Jaborandi—*Value in Obstinate Hiccough*.—Dr. Pagenstecher reports a case of hiccough which had resisted every known remedy, including the bromides, morphine, chloroform, and electricity. The patient's diaphragm contracted in the most violent manner about twenty or thirty times a minute, and he had been unable to take any nourishment for three days. After receiving four grams of jaborandi-leaves, in the form of a decoction, he had a profuse perspiration, after which the hiccough was completely checked.—The South. Pract., from Centralb. f. d. ges. Therap.; Amer. Jour. Phar., Oct. 1885, 502.

Ailanthus glandulosa, Desfontaines—*Proximate Analysis*.—Fred. Horace Davis, Ph. G., has subjected the bark of this tree to proximate analysis; it is not stated whether the bark of the branches or of the trunk was used for the purpose.

By exsiccation at 100°C., the air dry bark lost 7 per cent. of moisture, and on incineration yielded 5.92 per cent. of ash; of the latter 25.8 per cent. was soluble in water (potassium and sodium chloride and phosphate), and the insoluble portion contained calcium, magnesium and iron as carbonate, sulphate and phosphate. The bark was successively treated with petroleum benzin, ether, alcohol, cold water, boiling water and dilute acid; fixed oil, chlorophyll, resin, wax, sugar, tannin, albumen, gum, starch, pectin, oxalic acid, and probably another crystallizable organic acid, soluble in alcohol, were obtained. Distillation with water yielded a trace of volatile oil. Alkaloids and glucosides could not be detected.—Amer. Jour. Pharm., Dec. 1885, 600.

Ailanthus—*Poisonous Action of the Leaves*.—Mr. Caraven-Cachin has observed that ducks fed with ailanthus leaves died in a few hours, and attributes this effect to a poisonous principle residing in the very acrid juice.—Jour. Phar. Chim., Dec. 1885.

Diosma crenata—*Chemical Characters of the Volatile Oil*, which see under "Materia Medica."

Quassia—*Preparation of Efficient Fly Plates*, which see under "Pharmacy."

Irvingia Oliveri, Pierre—*Description of Plant and of Cay-cay Wax obtained from it*.—Mr. J. B. Vignoli gives a full description of the tree, which, according to Mr. Pierre, director of the Botanic Garden at Saigon, yields the so-called

Cay-cay Wax.—The tree is common in Cochin-China. The fruit is an ovoid yellow drupe, of the size of a lemon and with a fibrous mesocarp, and contains a seed of the size of an almond, having a brown, smooth and brittle testa, and containing a large embryo and a small quantity of albumen. For preparing the fat, the seeds are exposed by the natives to the sun for some time, then bruised, exposed to steam and then expressed, the yield being about 20 per cent. of the fresh seeds. The dried seeds weigh on the average 0.7 gm., and on being treated with carbon disulphide yield 52 per cent. of fat.

The cakes of cay-cay wax are usually in the form of truncated cones, weighing about 2.5 kilos. It is of a grayish yellow color, unctuous to the touch, and has a peculiar odor, becoming stronger and disagreeable when heated. It is readily soluble in ether and carbon disulphide, also in hot alcohol, but dissolves sparingly in cold alcohol. At 37° C. it becomes soft, melts at 38° , and solidifies again at 34° . It is easily saponified, and yields 68.7 per cent. of fatty acids, 30.2 of which is oleic acid, the remaining acids being probably stearic, and several of these liquid at the ordinary temperature.

Cay-cay wax is only used for candles by the natives, bamboo joints being the moulds. These candles give a light somewhat inferior to that of stearin candles, and when burning do not give off a disagreeable odor.—From the author's "thesis." Montpellier, 1886.

Peganum Harmala, Lin.—*Character of Alkaloidal Constituents*.—The alkaloid *harmaline*, $C_{13}H_{14}N_2O$, was isolated from the seeds by Goebel in 1837, and subsequently (1847) investigated by Fritzsche, who also discovered a second alkaloid, *harmine*, $C_{13}H_{12}N_2O$. With the view of ascertaining their chemical constitution, the two alkaloids have been farther studied by O. Fischer and E. Taeuber, who find that

Harmaline crystallizes from wood spirit in yellowish scales, melting with decomposition at 238° C., yielding colored strongly fluorescent salts, and on being warmed with strong sulphuric acid, giving a solution of harmalin-sulphonic acid which after dilution with water exhibits a beautiful sky-blue fluorescence. Treated with fuming hydrochloric acid under pressure, crystalline *harmalol* is obtained, which is orange-red or brick-red, somewhat soluble in water, and in this solution shows a magnificent green fluorescence; it is probably identical with the yellow coloring matter contained in the seeds. By the oxidation of harmaline with nitric acid, harmine is formed, but the latter could not be converted into the former by reducing agents. Harmine crystallizes in colorless needles, melts with partial decomposition at 256° C., and is partly sublimable; its colorless salts show in diluted solution indigo-blue fluorescence. Treatment with fuming hydrochloric acid converts it into a phenol, *harmol*, which in acid solution has a violet fluorescence. By oxidation with

chromic acid *harminic acid* $C_{10}H_8N_2O_4$ is obtained in silky needles.—Amer. Jour. Pharm., Feb. 1886, 89; from Ber. D. Ch. Ges., 1885, 400-406.

Evodia longifolia—*Use of the Leaves*.—This plant is a native of the Fiji Islands. The leaves are said to be useful as a preventive of abortion; they are steeped in the milk of the cocoanut, the infusion being taken for several weeks or months. A Brazilian species—

E. febrifuga, St. Hil., is astringent and tonic. The bark of the Japanese species—

E. glauca contains berberine (see Proceedings 1879, 207).—Amer. Jour. Phar., Nov. 1885, 559.

GERANIACEÆ.

Linseed—*Analyses of the Commercial Crushed Seeds and Meals*.—Mr. Wm. Lawson communicates the results of some investigations undertaken with a view to find what relation the “crushed linseed” and the “linseed meals” of the market bear to pure linseed. Johnstone and Anderson give results of analyses of linseed as follows:

	Moisture.	Oil.	Albuminous Compounds.	Gum, Sugar.	Fibre.	Ash.
Johnstone . .	9.0	25 to 35	19 to 25	34.0	8.0	5.0
Anderson . .	7.5	34.0	24.44	22.73	8.0	3.33

The author obtained the following figures in the analysis of the crushed linseeds:

Crushed Linseed.	Moisture.	Oil.	Albuminous Compounds	Gum, Sugar.	Fibre.	Ash.
1	8.09	33.52	21.12	23.74	8.50	5.03
2	8.07	31.21	21.62	28.10	6.76	4.24
3	8.02	34.12	19.56	27.98	6.11	4.21
4	8.24	30.28	17.50	29.86	8.40	5.72
5	7.28	34.04	16.75	31.04	7.09	3.80
6	7.19	35.20	22.62	25.23	5.40	4.36
7	6.08	30.52	22.12	20.44	7.08	7.76
8	7.14	35.52	24.68	21.57	7.09	4.00
9	8.12	32.21	20.52	27.53	4.88	6.74
10	9.30	28.17	19.56	32.72	6.12	4.13
11	10.27	28.75	19.56	25.39	10.00	6.03
12	10.21	27.64	21.12	27.85	6.58	6.60
13	8.12	38.00	18.56	23.68	5.88	5.76
14	10.83	7.92	22.62	40.13	8.50	10.00
15	7.98	28.00	25.25	29.44	5.24	4.09
16	8.07	32.00	23.81	27.00	4.21	4.91
17	10.72	26.80	20.56	30.08	5.82	6.02

The examination of ordinary linseed meals gave the following results:

Linseed Meal.	Moisture.	Oil.	Albuminous Compounds.	Gum, Sugar, Fibre.	Ash.
1	9.76	11.52	24.16	46.06	8.50
2	9.50	7.20	16.43	58.87	8.00
3	12.00	3.76	13.37	62.11	8.76
4	10.60	10.48	28.31	45.40	5.21
5	11.61	2.00	20.56	58.19	7.64
6	10.80	8.24	20.06	52.90	8.00
7	10.76	13.92	20.56	49.02	5.74
8	9.86	7.10	25.25	46.29	11.50
9	10.32	8.48	22.52	50.96	7.72

—Phar. Jour. and Trans., Sept. 19, 1885, 245.

Linseed Cake, &c.—Estimation of Oil.—Mr. Spencer Pickering gives the following simple and effective method for determining the amount of oil in linseed and other cattle cakes. The sample is placed together with about 50 cc. of ether in a small well-stoppered bottle, tying the stopper down, and leaving the bottle in a vessel of boiling water for fifteen to thirty minutes. The solution of oil is decanted into a small weighed flask, the residue in the bottle washed with ether, and the washings added to the contents of the flask; the ether may then be distilled off, and the residual oil dried at 100° C.—Amer. Drugg., July 1885, 132; from Chem. and Drugg.

MALVACEÆ.

Cotton Seed—Analysis of the Press Cake.—Mr. Sacc has communicated to the Acad. d. Sciences an analysis of the press cake of cotton seed, which contains casein 6.0, dextrin 0.2, sugar 2.0, fibrin 23.7, woody tissue 32.1, starch 9.6, greenish yellow oil 9.6, yellow wax 0.8, water 8.0, and ash 8.0. On grinding, 56.5 of yellowish meal and 40.5 of black bran were obtained. The author regards the meal as being of value in bread baking for taking the place of milk, and in the refining of sugar for removing excess of lime.—Amer. Jour. Phar., Sept. 1885, 436; from Archiv. d. Phar., June, 1885, p. 453.

BUTTNERACEÆ.

Cola Nut—A Remedy against Excessive Drinking.—Mr. Watson Smith draws attention to the cola nut as a remedy against habitual drinking, citing several cases in which it has proved efficient. He attributes its efficiency to the considerable quantity of caffeine (2 per cent.) and theobromine which the drug contains.—Phar. Jour. and Trans., June 26, 1886, 1096; Med. Chronicle, June 1886.

TERNSTROMIACEÆ.

Tea—Method of Determining Theine.—Prof. A. Hilger recommends

the following method for determining the percentage of theine in tea : 10–20 grams of the tea are extracted completely with boiling water, three extractions usually sufficing. The filtrate is treated with basic acetate of lead, avoiding a large excess, the precipitate filtered off, and the filtrate and washings treated with sulphydric acid to remove excess of lead. The liquid is now mixed with washed sand and some magnesia or lime, evaporated to dryness, and the dry mass completely extracted (in a Soxhlet's apparatus) with boiling chloroform. The residue remaining after evaporating the chloroform is nearly colorless, and may be taken to represent the theine when dried at 100° to constant weight. It is obtained perfectly colorless by recrystallization from alcohol or boiling water.—Arch. d. Pharm., Nov. (1) 1885, 827–828.

GUTTIFERÆ.

Gamboge—Detection in Mixtures.—Prof. Hirschsohn gives the following method : Solutions containing gamboge are mixed with powdered glass, evaporated to dryness, powdered, and treated with benzin. If the benzin solution is colorless it is again shaken with the powder and sufficient hydrochloric acid to make the solution decidedly acid. Benzin does not dissolve gamboge in presence of soap. If after treating with benzin and acid the benzin solution is colorless, no gamboge is present. If, however, the solution has a yellow cast, it is filtered and tested as follows : To a small portion of the filtrate is added a dilute solution of caustic soda ; if a red coloration is produced, gaseous ammonia is led into the remaining solution until it is saturated. The flakes which separate out are collected on a filter and washed with benzin before dissolving them in alcohol. This solution treated with an alcoholic solution of ferric chloride turns black, and on adding caustic soda the color changes from black to dark yellow, but never red, if gamboge is present. By this method Hirschsohn was able to detect 0.01 gram of gamboge.—Amer. Jour. Pharm., Dec. 1885, 606 ; from Phar. Zeit. f. Russl., 24, p. 609.

AURANTIACEÆ.

Bitter Orange—Proximate Examination of the Rind.—Mr. Tanret has submitted the rind of the bitter orange to proximate examination. By treatment of an alcoholic extract he has succeeded in isolating :

1. *A crystalline acid*, insipid and non-volatile, insoluble in water and in ether, slightly soluble in cold, but more soluble in boiling alcohol and in chloroform. Its composition is represented by the formula $C_{44}H_{22}O_{14}$.
2. *A non-crystalline resinous body*, extremely bitter, nearly insoluble in cold, but freely soluble in boiling water, in alcohol, in ether, and in chloroform. It has a composition approximating to hesperetic acid.
3. *Hesperidin*.
4. *Isohesperidin*, a crystalline glucoside, isomeric with hesperidin.

5. *Aurantiamarin*, a new glucoside to which the author attributes the bitterness of the peel. It is soluble in all proportions in water and in alcohol, but is insoluble in ether and in chloroform, and is the natural solvent of hesperidin and of the bitter resin (2).—Pharm. Jour. and Trans., April 3, 1886, 839; Compt. Rend. cii, 518.

Oranges—Use as a Galactagogue.—A case is reported in the "N. C. Med. Jour." in which the eating of oranges proved beneficial in deficient milk secretion, causing a plentiful flow of milk.—Amer. Jour. Pharm., Nov. 1885, 558.

AMPELIDEACEÆ.

Ampelopsis hederacea—Occurrence of Free Citric and Tartaric Acid in the Leaves.—Dr. Phipson having observed that an iron network had been attacked by a Virginia creeper, submitted the plant to closer examination. He found the leaves acid to the taste, and that upon steeping the leaves and twigs in cold water for forty-eight hours, notable quantities of citric and caffeic acid and a small quantity of tartaric acid were extracted. The neutralizing process of the liquid, calculated as citric acid, was equal to 2.18 per cent. of the weight of the leaves and stalks used. The leaves are also rich in a variety of quercitrin.—Chem. News, Aug. 7, 1885, 67.

VITACEÆ.

Grapes and Wine—Cultivation and Production in Ohio.—Mr. James O. Howells has contributed an interesting essay on the cultivation of grapes, the production of wine, and the character of the argols collected from them in Ohio. He states that the grape mostly used for the manufacture of wine is the Catawba, while of others the Delaware and the Concord seem to be favorites. During 1881, 10,642 acres of land were under cultivation, yielding 11,678,545 pounds of grapes, from which 884,895 gallons of wine were made. In 1882, 18,526,219 pounds were grown and 1,296,295 gallons of wine made. The author describes the method followed in the manufacture of wine. The production of argols is insignificant owing to the fact that our native wines are sold when comparatively new, and consequently no opportunity is given for their deposit. On casks which have stood for years undisturbed, the deposit is two or three inches thick. A number of samples of argols were assayed for their percentages of tartaric acid by the scheme given in "Allen's Commercial Organic Analysis." Three samples of red wine argols gave 51.57, 53.57 and 52.8 per cent. of tartaric acid (average 52.65 per cent.), and three samples of white wine argols gave 69., 66.3 and 70.2 per cent. (average 68.43 per cent.). The red argols 16.43 per cent. of ash; the white argols 27.63 per cent. A solution of the argols in hydrochloric acid shows the presence of potassium and calcium only in those from red wines, while those from white wines contained in addi-

tion traces of magnesium and of iron.—*Amer. Jour. Phar.*, July 1885, 323-328.

Native Wines and Brandies — Examinations.—Mr. Oscar A. Kropf has made an examination of native white and red wines and brandies, in order to ascertain to what extent these conform to the requirements of the U. S. Pharmacopœia, and are adapted to medical and pharmaceutical purposes. With few exceptions these native products conformed to the officinal requirements, if one may judge from the table, giving a résumé of the author's results.—*Contrib. Dep. Pharm. Univ. Wisc.*, No. 1 (1885) 32-37.

California Wines and Brandy — Medicinal Qualifications.—Mr. G. Baumert communicates the results of analyses of different California wines, and makes some critical remarks in reference to their adaptability for medicinal use. He expresses the opinion that at the present time these wines are not suitable, but that the faults in the manufacture of these wines can easily be overcome, and that future products will gradually become more suitable for medicinal uses. Regarding California grape brandy, this being undoubtedly the product of the distillation of fermented grape juice, it corresponds in all respects to Pharmacopœial requirements, and is far superior to much that is brought into the market as French or Cognac brandy.—*Arch. d. Pharm.*, April (1) 1886, 286-292.

Wine — Determination of Source of Red Coloring Matter, which see under "Organic Chemistry."

ACERACEÆ.

Acer Dasycarpum, Ehrhart.—*Examination of the Leaves.*—Mr. Emil Weschke has examined the leaves of the white or silver maple, in the hope of isolating an alkaloid resembling cocaine. The results were not as anticipated, though a substance affording reactions similar to those of alkaloids, was found. Ether extracted from alkaline solutions leaves a very small amount of a neutral crystallizable principle, which was not further examined.—*Contrib. Dep. Pharm. Univ. Wisc.*, 1886, 29.

SAPINDACEÆ.

Aesculus Hippocastanum, Lin.—*Examination of the Leaves.*—The Sapindaceæ being botanically closely related to the Erythroxylaceæ, it was deemed of interest to ascertain whether the leaves of *Aesculus Hippocastanum*, Lin., contain cocaine or an alkaloid having analogous properties. F. O. Ray treated the leaves according to the improved process of Dr. Squibb for the assay of coca leaves, (see *Proceedings* 1885, 324), and also according to the process of Dr. A. B. Lyons (see under *Cocaine*), but without obtaining any decided reaction for an alkaloid. Other experiments, made for the purpose of determining the presence of a volatile alkaloid, of a volatile acid, or of caffeine (which is present in the seeds

of *Paullinia sorbilis*, *Martius*), gave likewise negative results, and it was ascertained that aesculin, which is abundantly contained in the bark of the horse-chestnut, is apparently entirely wanting in the leaves.

Gehe & Co. ("Phar. Zeitung," 1885, No. 78) obtained from horse-chestnut leaves traces of a volatile liquid alkaloid, colored red by sulphuric acid, and probably identical with a similar substance contained in coca leaves.—Contrib. Dep. Phar. Univ. Wisc., 1886, pp. 27, 28.

Nance Bark—*Description and Proximate Examination*.—Mr. Ferdinand Holberg describes this bark, the botanical origin of which is in doubt,* as occurring in pieces which are from 8 to 16 inches long and $\frac{1}{4}$ to $\frac{1}{2}$ inch thick; externally it is grayish brown, warty, transversely wrinkled and deeply fissured, and has a thick, corky layer; internally it is brownish red, wrinkled and striate from prominent bast fibres; the transverse fracture is splintery, and the longitudinal fracture smooth.

The powdered bark lost on drying 12.4 per cent. of moisture, and yielded 6.8 per cent. of ash, of which 28.17 per cent. was soluble in water, 67.25 soluble in hydrochloric acid, leaving an insoluble residue of 4.58 per cent.

The result of the proximate analysis was as follows:

Extracted by petroleum spirit, crystalline principle	1.85
Extracted by ether, resin and crystalline principle	4.87
Extracted by alcohol, tannin, glucose, etc.	28.26
Extracted by water, glucose, coloring matter, etc.	3.15
Extracted by soda, albuminoids, etc.	2.58
Extracted by hydrochloric acid, calcium oxalate	2.73
Cellulose (after treatment with chlorine)	34.48

The crystals obtained from petroleum spirit were feathery, white, soluble in absolute alcohol and strong ether, dissolved in sulphuric acid with a yellow color, melted at 176°C., and did not react with alkaloidal reagents. The ether extract was mostly soluble in water, the insoluble portion dissolving in alkalies with a dark red-brown color. Alkaloids could not be detected, but the aqueous solution rendered alkaline yielded to petroleum spirit a crystalline principle which was readily soluble in water, was not affected by alkaloidal reagents, and did not reduce Fehling's solution. The author estimated the bark to contain 26.2 per cent. of tannin.—Amer. Jour. Pharm., May 1886, 239-240.

ERYTHROXYLACEÆ.

Coca—*Cultivation*.—Dr. Henry Rusby contributes a lengthy and interesting paper on the cultivation of coca in Bolivia, which may be consulted in Therap. Gaz., 1886, 14-18, and Amer. Jour. Phar., April 1886, 188-195.

* Professor Maisch observes that in a list of plants published in Dondé's *Botanica Van-cenes* is stated to be a *Malpighia*, probably *M. glabra*, Lin.

*Coca Leaves**—*Percentage of Alkaloid, Cause of Inferiority, etc.*—Dr. A. B. Lyons, in his very exhaustive paper on the "Alkaloids of Coca Leaves" (see *Cocaine*, "Organic Chemistry") states that coca leaves when they reach this country contain, so far as assays have yet been able to show, not more than 0.8 per cent. of cocaine. He has examined leaves which yielded no more than 0.15 per cent., and of this scarcely any was capable of forming crystallizable salts. Freshly imported leaves of a recent crop contain generally 0.65 to 0.8 per cent. of extractible alkaloid, but of this not more than one-half generally consists of crystallizable alkaloid. In manufacturing operations the yield of alkaloid is much below what assays show to be present. It is doubtful indeed whether any method of assay yet devised extracts nearly all the alkaloid. A good sample of coca leaves yields a tincture which when titrated with Mayer's reagent gives an apparent alkaloidal strength much higher than the assay indicates, but it is altogether possible that the precipitate consists in part of compounds not alkaloidal. Some assays have been reported from Bolivia which seem to show that the leaves when freshly gathered contain a much larger proportion of alkaloid than after transportation to this country. This confirms the statement that has been often made, that in Peru and Bolivia coca leaves are believed to deteriorate very rapidly, so that when more than six months old they are not considered fit for use. It is even stated that the coca chewers find that the leaves when they arrive at the coast, in the usual mode of transportation, are less active than at the beginning of their journey. In a climate as damp as that of the coca-producing regions it is probably next to impossible to dry the leaves properly before packing, and it is easy to understand how under these conditions they suffer even from so short a journey. Some packages of coca shipped from Lima apparently in good condition, at the end of their voyage were found by the author much heated—temperature in the centre of the package 110° F.—and evidently greatly deteriorated. These leaves contained nearly 18 per cent. of moisture; had they been really dry, *i. e.*, so as to contain 10 per cent. or less of moisture, they would probably have lost nothing in the transportation. The alkaloid obtained from leaves that have deteriorated is always more or less dark colored, and contains a small proportion only that is capable of taking on the crystalline form. From good leaves the alkaloid obtained in assays is nearly or quite colorless, and is left in the form of a crystalline mass on evaporation at a low temperature of the ether. Crude cocaine has a characteristic tobacco-like odor, which suggests the idea that some portions of the product have become split up so as to reveal the pyridine constituent of the base. This odor, however, does not disappear when the alkaloid is neutralized. So-

* This paper is accompanied by a botanical plate of *Erythroxylon Coca*, Lamark, being a reproduction of that contained in Bentley and Trimen's well known work on Medical Plants.

lutions of the crude product in alcohol have generally a brownish color, which is deep in proportion to the amount of impurity present. After the cocaine has all crystallized out there remains a dark-colored syrupy liquid, which consists partly of alkaloid apparently identical in chemical and physiological characters with cocaine, but which does not itself crystallize, and does not form crystallizable salts. For this uncrystallizable alkaloid the names cocaine and cocainoidine have been proposed. It appears to bear to cocaine a relation similar to that of chinoidin to quinine, or of invert sugar to sucrose, but no ultimate analysis has as yet been made of it, and our knowledge of it is very incomplete. Besides this there is often present a feebly basic, extremely bitter substance, which possibly may be ecgonine, of which accounts accessible are very meagre. The malodorous constituent already mentioned seems not to have the character of an alkaloid, for its odor remains unchanged after neutralization with an acid. It is easily separated from the crystallizable alkaloid by repeated crystallizations, and this appears to be the only way of obtaining a pure product.—*Amer. Jour. Pharm.*, Oct. 1885, 465-467.

Coca Leaves—Assay.—Referring to Dr. Squibb's method of assaying coca leaves (see *Proceedings* 1885, 325), Dr. A. B. Lyons observes that it is one which must necessarily consume a good deal of time and, moreover, does not separate the whole of the alkaloid contained in the drug; though, he admits, it is one that is useful to the manufacturers because the method adopted in the assay is the same as that employed on the manufacturing scale, and the result of the assay may therefore be expected to indicate the practical yield of alkaloid in the manufacturing process. Dr. Lyons having considerable experience in the assay of coca leaves has found a modification of the method of Prollius for the assay of cinchona bark to be far more expeditious and to give more satisfactory results. His modification of the method may be briefly given in the following:

An average sample of the leaves being selected, they are dried at not exceeding 45°C. (113°F.) and, the loss of weight being noted, they are reduced to No. 30 powder. Ten grams of this powder are then shaken occasionally during 24 or 36 hours, with 100 cc. of a mixture of 95 volumes of stronger ether, and 5 volumes of spirits of ammonia (the latter being a mixture of 1 volume of concentrated ammonia, sp. gr. 0.9094 with 19 volumes of absolute alcohol). Fifty cc. of the clear ethereal fluid are then rapidly measured into a separator, 5 cc. of water containing $\frac{1}{10}$ by volume of sulphuric acid are added, and the two liquids are carefully shaken together, allowed to separate, and the acid liquid drawn into a bottle of 30 cc. capacity. Wash the ethereal liquid two or three times successively with $2\frac{1}{2}$ cc. of water slightly acidulated with sulphuric acid, and mix the washings with the acid fluid first obtained. The acid liquor is now washed once with 10 cc. of ether; 10 cc. of fresh ether are then added, followed by dry carbonate of sodium in slight excess, guarding

against possible loss by effervescence. After shaking (not too violently) so that the liberated alkaloid may be dissolved by the ether, the clear ether-layer is removed into a tared capsule or beaker by the aid of a pipette, and the residual liquid is washed with a second and third portion of ether—the evaporation of the ethereal solution going on in the meantime by setting the beaker into a warm place. A fourth and fifth washing with ether may be necessary under some circumstances, but usually three suffice; the completion of the washing being indicated when a drop of the aqueous solution, acidulated with dilute hydrochloric acid, fails to produce more than slight milkiness.

If, after the complete evaporation of the ethereal solutions, the residual alkaloid is wholly composed of oily drops, and these fail by coaxing to crystallize, the probability is that the drug contains little crystallizable alkaloid. The alkaloid obtained by this treatment should also be colorless, otherwise the leaves will prove worthless for the preparation of cocaine. After observing the physical properties of the alkaloid, the cocaine is placed in a dry oven and dried to constant weight at a temperature not exceeding 100°C . (212°F .). If desirable, the result obtained may be verified by titrating the acidulated solution of the alkaloid by Mayer's reagent, 1 milligram of alkaloid requiring $\frac{1}{10}$ cc. of the reagent for complete precipitation. The alkaloid obtained represents 5 grams of drug; by dividing the weight in milligrams by 50 we therefore obtain the percentage of alkaloid in the drug. By the method proposed, six or eight assays may be carried on together and completed within 36 hours from the start.—The Pharmacist, Sep. 1885, 276–280.

Coca and Cocaine—Properties, etc.—Professor Bignon has for a considerable time studied the properties of coca in Peru, and has arrived at conclusions which are, upon certain conditions, at variance with generally accepted ideas. His notes are as follows:

1. In fresh coca leaves, or in recently dried leaves that have not undergone any fermentation, there exists only one inodorous, crystallizable alkaloid, *cocaine*.

2. Coca leaves, exhausted completely of their natural alkaloid (cocaine), and submitted to the action of alkalis at a temperature of 100°C ., yield upon distillation a new volatile base, having a very strong odor, *hygrine*.

3. Hydrochloric acid, even dilute, acts strongly upon cocaine, decomposing it partially. Solutions also that are not absolutely neutral undergo a commencement of decomposition; they become odorous, yield a difficult crystallization, and leave a syrupy mother-liquor.

4. There are few alkaloids so sensitive as cocaine to physical and chemical action. This ought always to be borne in mind in all manipulations to which it is submitted.

5. Coca leaves dried in damp weather, or pressed into sacks before

being completely dried, undergo a fermentation that destroys the cocaine. The destruction goes on gradually until the complete disappearance of the alkaloid.

6. The fresh leaves, or leaves freshly dried in the open air in fine weather, with frequent turning and sheltered from moisture and dew, yield easily eight grams per kilogram, and the finer sorts can yield ten grams and upwards in exceptional cases and on the spot where they are grown.

7. The anæsthetic properties of the alkaloid are attenuated in the salts. The best therapeutic results are always those that are obtained with the pure alkaloid.

8. Contrary to the generally accepted opinions, the author believes that the irritation produced by the alkaloid is due to the cocaine, and not to hygrine. It appears to him more reasonable to admit that a rather energetic base like cocaine should irritate, than to suppose that their irritation should be due to one or two thousandths of hygrine, which would be the maximum quantity contained in pure cocaine.

9. The author believes, also, that the dilatation of the pupil is a property inherent in cocaine and attenuated in its salts.

10. He believes that solutions which do not produce this dilatation have undergone a commencement of decomposition, and contain a derivative body, unfortunately easily produced, which is very soluble in water, and uncrystallizable. As to the composition of this body the author is ignorant, though it seems to resemble a glucoside.

The author calculates that a Peruvian Indian will consume coca leaves corresponding to 30 or 40 centigrams of cocaine per day, and he concludes that doses of cocaine that do not exceed one or two centigrams must be considered illusory. He observes that coca contains the cocaine in the state of an inert salt. The Indian never chews coca alone; he mixes it with lime and ash, that is to say, with strong bases to isolate the cocaine, and it is in this the anæsthetic properties and numbing effects upon the mucous membrane of the stomach, that he seeks, are found. The author, therefore, recommends that the alkaloid should be employed to the exclusion of its salts, using it in form of salve (with petrolatum) for external purposes, and internally in alcoholic solution.—Phar. Jour. and Trans., Sept. 26, 1885, 265; from *Les Nouveaux Remèdes*.

Coca—Use in Form of Cigars, Cigarettes, etc., in Throat Affections.—Dr. Lewis has used cigarettes of coca leaves mixed with tobacco for the past nine years in the treatment of throat affections. Dr. F. E. Stewart also has employed a cigar made of coca leaf with a wrapper of mild imported tobacco; also a cigarette of coca wrapped with rice paper, and a "smoking tobacco" made of coca without admixture of any kind, which may be smoked in a pipe. By the use of these preparations the peculiar effects of coca were obtained, though in a milder degree than after taking

it internally.—*Amer. Jour. Pharm.*, Dec. 1885, 613; from *Phil. Med. Times*, Sept. 19, 1885.

POLYGALACEÆ.

Polygala—*Distinction of Species*.—Mr. O. Linde has studied the anatomy of senega root, and finds no anatomical difference in the microscopic structure of the two varieties—"Western" senega (*Polygala Senega*) and "Southern" senega (*P. Boykinii*.) Although the keel and broad medullary rays are less evident in the "Southern" than in the "Western" senega, he finds these structures present to a certain extent. The only marked difference observed by him is in the outer suberous layer, which is distinctly thinner in the "Southern" senega, this being probably the reason of its brighter color. He has also examined the roots of several other species of the genus, and is enabled to classify them into sections; the first, containing either a fatty oil in the thick root bark, as in *P. Senega* and *P. Boykinii*, Nutt., or starch, as in *P. violacea*, Vahl. The roots of the second have a thin root-bark, with no appreciable amount of deposit in it, and have medullary rays consisting of thin-walled cells, as in *P. linoides*, Pan., and *P. corisoides*, St. Hil., or have medullary rays consisting of thick-walled porous cells, as in *P. vulgaris*, L., *P. Chamæbuxus*, *P. sanguinea*, L., *P. ambigua*, Nutt., *P. incarnata*, L., *P. purpurea*, Nutt., *P. lutea*, L., *P. verticillata*, L., *P. cruciata*, L., *P. paniculata*, L., and *P. grandiflora*, Lodd. The author does not appear to be acquainted with the "Northern" senega of commerce (*P. Senega*, var. *latifolia*), nor to have examined the roots of *P. Poaya*, Mart., *P. tenuifolia*, or *F. japonica*, which are used in Brazil, China, and Japan. The distinctive characters of the species examined are carefully recorded by the author.—*Pharm. Jour. and Trans.*, Feb. 27, 1886, 724-725; "Flora," Jan. I and II, 1886.

Krameria lanceolata, Torrey—*Proximate Examination*.—Mr. Henry F. Roberts has had opportunity to subject a sample of the root of *Krameria lanceolata*, from Florida, to proximate examination. The roots were in pieces of from four to six inches in length and one sixth to one-third inch in diameter, externally dark-brown, longitudinally wrinkled, marked with warts and the scars of rootlets, and having some rootlets attached. The bark constitutes about two-thirds of the root, is internally of a reddish tint, and breaks with a short, granular fracture. In its anatomical structure it appears to closely resemble the *savanilla rhatany* (*K. tomentosa*, St. Hilaire). It has no odor, but a very astringent taste. Following the officinal process for *Extractum Krameriaë*, the author obtained from the roots of *K. lanceolata* 34.5 % of extract; whilst the officinal roots—from *K. tomentosa*—yielded only 14.5 %. Moreover, the extract from the former species was also found to be richer in tannin, containing 49.26 % (= 17 % when referred to the root), whilst the extract from *K. tomentosa* only con-

tained 44.7 %, making 6.48 % when referred to the root. These results speak exceedingly favorably for the American species, and call for further attention to the subject.—Contrib. Dep. Pharm. Univ. Wisc., No. 1 (1885), 21-23.

Guayaquil Rhatany—*A New Variety*.—Mr. E. M. Holmes draws attention to a new variety of rhatany which was imported from Guayaquil, in Equador, and which differs markedly from any of the commercial varieties familiar to the author. From the examinations of the microscopic structure of the root so far made, he has reason to believe the plant yielding it, although probably not a *Krameria*, may belong to a closely allied genus. The following are the characters of the new rhatany: It is a large woody root, from 1 to 2 inches or more in diameter in the larger specimens, and about $\frac{1}{2}$ inch in the smaller roots. All the pieces seen by the author are strongly contorted. The bark is of a reddish-brown color with blackish streaks, is thin in comparison to the medullium, is of a fibrous texture, and is somewhat striated on the surface and dotted over with small warts. It has an astringent taste, but no marked odor. From experiments made by Mr. F. W. Passmore, under the direction of Dr. B. H. Paul, it is evident that the Guayaquil rhatany contains a larger quantity of tannin than the Peruvian drug, but less than either the Savanilla and Pará varieties. The bark of the root, however, which is relatively large (amounting to 38 per cent. of the entire root), is more than twice as rich in tannin as either of those roots.—Phar. Jour. and Trans., April 17, 1886, 878-879.

PAPAVERACEÆ.

Opium—*Cultivation in Minnesota*.—During the year 1885, Emil Wesche experimented on the cultivation of different species of Papaver at New Ulm, Minn., and from the unripe capsules of *P. somniferum* prepared a quantity of opium which, in the air-dry condition, contained 2.8 per cent. of moisture, and, after drying, yielded 15.230 per cent. of morphine, 0.325 per cent. of narcotine, 0.416 of codeine and 3.500 per cent. of meconic acid. The author does not believe that the cultivation of the poppy for the production of opium in this country would be attended with profit.—Contrib. Dep. Pharm., Univ. Wis., 1886, pp. 10-18.

Opium—*Source of Inaccuracy in U. S. Process of Assay*.—Mr. Herbert Lloyd draws attention to a source of inaccuracy in the morphimetric process of the U. S. Pharmacopœia. He put definite quantities of pure alkaloid through the process, and found that there was always an average shortage of about 0.08 gm. on the morphine recovered from 50 cc. It was evident that the loss was occasioned either by the decomposition of the morphine, or by the solvent action of some of the reagents upon it. The chloride of ammonium for instance, of which 3.0 grams are used, when 0.1 gm. would be ample theoretically, might

have the latter effect. To test this, experiments were made with pure morphine, as before, but 0.1 gm. of chloride of ammonium was used in each case. This amount was found insufficient to entirely release the alkaloid, indicating that the 50 cc. of liquor from which the morphine was precipitated contained more lime than the same quantity of lime-water (on which the 0.1 gm. chloride of ammonium was based) would contain. This was proved to be the case, as will be seen hereafter. Further experiments were made, using 0.2 gm. chloride of ammonium, but in the results the loss was almost as great as when 3.0 gm. of the reagent were used. Next, to ascertain if the loss was *invariable* (as was first supposed), regardless of the amount of morphine used, the following four assays were made:

1.0 gm. morphine was put through the U. S. P. process and lost 0.089 gm. on $\frac{5}{8}$ (50 cc.); 0.75 gm. lost 0.085 gm. on $\frac{5}{8}$ (50 cc.); 0.5 gm. lost 0.070 gm. on $\frac{5}{8}$ (50 cc.); 0.25 gm. lost 0.060 gm. on $\frac{5}{8}$ (50 cc.). These experiments were repeated, and gave practically similar results, showing that the loss was in direct proportion to the quantity of morphine present. As previous experiments showed clearly that the presence of morphine increased the solubility of the lime, and as an increase of lime, of course, means an increase of free ammonia, it was assumed that the variation in loss might be largely due to the solvent action of that alkali. The loss, too, was found to be slightly increased by the 5 cc. of alcohol, which is added before precipitating. The author's results lead him to the conclusion that in all assays made by the U. S. P. method, 0.06 gm. to 0.09 gm. should be added to the result, according to the amount of morphia recovered.—*Amer. Drugg.*, Dec. 1885, 221.

Opium—Assay of Commercial Samples of Powder.—Mr. Adam Conrath has examined three samples of powdered opium of the market by the process of the U. S. Pharm., and found them to yield respectively 12.4, 11.2, and 12.4 per cent. of morphia. *West. Drugg.*, Sept. 1885, 233; from *Proc. Wisc. Pharm. Assoc.*

Opium—Preparation of the Powder.—Referring to the difficulty of reducing opium to fine powder without subjecting it to artificial heat and thereby causing more or less change, Mr. Rother advises that the Pharmacopœia should recognize a powder made by pulverizing air-dried opium with sufficient lactose to restore the original weight. Such a mixture can be readily reduced to fine powder, and will, he thinks, represent the original opium more accurately than the commercial powders made from opium which has been almost roasted.—*Drugg. Circ.*, March 1886, 52.

Opium—Absence of Uniformity in the Doses of its Preparations of the B. P.—Mr. Harry Napier Draper contributes a paper on the opium and morphine doses of the British Pharmacopœia, in which he points out the inconsistencies of the doses of morphine and of the different galenical

opium preparations as contrasted with that of opium itself. The basis of the author's paper is a carefully compiled table embracing the most important preparations containing morphine and opium, and showing the officinal strength, the relative dose, the B. P. dose, the amount of opium represented in a given quantity, and the amount of acetate or hydrochlorate of morphine represented by the same. The paper will be consulted with interest.—Phar. Jour. and Trans., Dec. 26, 1885, 546-547.

Sanguinaria canadensis.—*Microscopy of the Rhizome*.—Prof. E. S. Babin gives an interesting description of the rhizome of *Sanguinaria canadensis* and of its microscopic characters. The pith of the rhizome is large, composed of large thin-walled parenchyma cells, most of them containing numerous small rounded starch grains, but some, precisely similar in shape, are filled with a red fluid. The pith is bounded by a thin interrupted circle of fibrovascular bundles, which consist of soft bark, wood parenchyma, tracheïds and annulate, reticulate and spiral ducts, but contain neither true bark nor wood cells. Outside the cambium layer is the bark parenchyma, composed of cells smaller in size than those of the pith, but otherwise similar to them. The larger proportion contain starch, but some are resin-bearing, and there are also irregularly arranged milk-ducts. The lacticiferous tissue is an interesting subject of study from a morphological standpoint, as in the rhizome it shows every gradation of development from simple, isolated resin or milk cells, through those that are clustered in rows of two or three, and those that form an irregular and long chain, but still have a distinct cellular character, to those which form distinct tubes. There can be no question that the true milk-ducts of this plant have been developed from cells by the elongation and disappearance of their end partitions. The milk or resin cells of the pith are all isolated; in the parenchyma of the bark, they are sometimes isolated, sometimes in groups of two or three, sometimes they form irregular chains and sometimes more regular ones, while in the phloem portion of the fibro-vascular bundles true lacticiferous ducts occur. To this portion of the stem they are apparently confined. A few layers of cells at the circumference of the rhizome have their cell walls more or less suberized, the tracheïds and ducts have their walls lignified, as shown by the phloroglucin and aniline chloride tests, but all the other cells of the rhizome have cell walls of unmodified, or but slightly modified, cellulose. The colored fluid in the isolated milk or resin cells of the pith and bark does not appear to be identical in color or composition with that in the milk-ducts proper, the latter being much lighter colored and appearing to contain less resin, while the resin cells that occur in chains contain a fluid of intermediate character. The author's paper is accompanied by excellent cuts showing the microscopic characters described.—The Pharmacist, July 1885, 201-204.

BIXACEÆ.

Annatto—Examination of Commercial Samples.—Mr. Wm. Lauren reports the results of his examination of ten commercial samples of annatto as follows:

	1	2	3	4	5	6	7	8	9	10
Moisture . .	21.75	21.60	20.39	69.73	18.00	18.28	15.71	38.18	19.33	22.50
Resin . . .	3.00	2.90	1.00	8.80	3.00	1.80	5.40	12.00	5.90	9.20
Extractive .	57.29	59.33	65.00	19.47	58.40	65.67	26.89	20.82	23.77	28.50
Ash	17.96	16.17	13.61	2.00	20.60	14.25	52.00	29.00	51.00	39.80
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ash—				Almost						
Soluble . .	13.20	12.57	7.50	Wholly	10.00	11.75	18.5	20.00	15.00	13.80
Insoluble .	4.76	3.60	6.11	NaCl.	10.60	2.50	33.5	9.00	36.00	26.00

The first six are the ordinary red rolls, with the exception of No. 4, which is a red mass, the only one of this class direct from the manufacturers. The remainder are brown cakes, all except No. 7 being from the manufacturers direct. The composition of the pulp surrounding the seeds of *Bixa orellana* is, according to Dr. John, as follows: Coloring, resinous matter, 28; vegetable gluten, 26.5; ligneous fibre, 20; extractive matter, 4; spicy and acid matter, a trace. The only analyses of annatto known to the author are those of Mr. Wynter Blyth, who states that a fair commercial sample was composed of: Water, 24.2; resin, 28.8; ash, 22.5; extractive, 24.5; and that an adulterated article contained: Water, 13.4; resin, 11.0; ash (iron, silica, chalk, alumina, and common salt) 48.3; extractive, 27.3. If this be correct it appears that the article at present in the market, or at least those examined by the author, are wretched imitations of the genuine thing. The best sample was found to be No. 4, notwithstanding the large percentage of water it contained, $\frac{1}{4}$ ounce of this being sufficient to color 60 pounds of butter.—Pharm. Jour. and Trans., Jan. 30, 1886, 645-647.

Annatto—Examination of Commercial Samples.—Mr. George W. Kennedy, in reply to a query, has contributed a highly interesting paper on the annattos of the market, in which he gives the details of the systematic examination of eight commercial samples. He concludes from his results that if the solubility of annatto in hot alcohol and certain other solvents can be accepted as a test of the purity of annatto, only two of the samples were adulterated to the amount represented by the query, viz., 75 per cent. In the face of this, however, one of these samples possessed the largest amount of coloring matter found in any of the samples. If the amount of moisture contained in each specimen is taken into consideration, which he thinks should be done, then all the specimens are far from being as

scandalously impure as has been reported. He failed to detect red lead, Venetian red, or turmeric in any of the specimens; one contained yellow ochre, one carbonate of lime, and one carbonate of potash, both of the two last named containing an undue proportion of chloride of sodium, which salt was found in all the samples. One sample contained a large amount of water. The insoluble matter in all cases appeared to be of vegetable origin, and is doubtless due to carelessness of manufacture.—Proc. Penn. Pharm. Assoc., 1886, 169-176.

Pangium edule, Reinwardt—*Characters and Uses*.—Attention has been recently directed by Chatel to the medicinal properties of this tree, which are well known in the East Indian islands, where the tree is indigenous and cultivated. It attains a considerable size, and has alternate, stipulate, long-petiolate, smooth and dark green leaves, which are about 10 inches long, cordate, entire or trilobed, and five to seven-nerved. The large flowers are axillary, the pistillate ones solitary and the staminate ones cymose. The fruit is a large globular or ovate indehiscent berry, with a red-brown or gray-brown punctate pericarp resembling that of the pomegranate. Imbedded in the pulp are numerous seeds attached to parietal placentas, and of an irregular globose and angular shape, one side being marked by the elongated hilum; the testa is hard and woody, dark gray or blackish, rough from projecting branching veins forming an irregular net-work, and encloses a fleshy and oily albumen surrounding a large embryo with a conical oblique radicle and with two foliaceous palmately veined cordate cotyledons.

According to Blume, quoted by Baillon, the plant contains a viscous extractive matter and an alkaloid resembling menispermene. All parts of the plant are said to possess anthelmintic properties, and a narcotic action, producing headache, drowsiness, nausea and a kind of intoxication and delirium, which may terminate in death. This applies to the bark, leaves, fruit and seed, the bark as well as the leaves being also used for stupefying fish. The leaves have an unpleasant acrid taste; and are often employed topically against cutaneous affections and ulcerations. The seeds are used for destroying body lice; after boiling and subsequent maceration in cold water, or after being roasted, they are harmless and are used as a condiment. A fixed oil is obtained from them which has a nutty flavor and is used like olive oil in preparing aliments, but has a purgative action upon those not accustomed to its use.—Amer. Jour. Pharm., Nov. 1885, 562; from Jour. de Méd. de Paris.

CISTINEACEÆ.

Cyprian Labdanum—*Collection, etc.*—In a former paper (1884), Mr. W. T. Thiselton Dyer had given an account of the singular instrument, the *Ladanisterion*, (see also Proc. 1879, 224-225), which from time immemorial has been in use in Crete for the collection of labdanum. The

author now contributes some notes furnished him by the British Commissioner, Mr. H. L. Thompson, respecting the collection of labdanum in Cyprus, where the collection is done chiefly by accidental means. There are three modes of collection: (1) With a stick drawn over the ground; (2) from the bells of goats; (3) from the beard and other long hair from the goats' bodies. The collection is carried on from about May to August, the annual product being 60 to 80, though a large quantity could be collected if there were a market for it. That collected from the goats' hair is inferior, a certain amount of the animal's hair always remaining in the gum. To keep the gum it is mixed with fine earth and stored away. When wanted for use it is cut up in pieces, boiled and strained to separate the earth. It is used in Cyprus as a plaster for colds and rheumatism, and appears to be also carried about the persons of the natives on account of its pleasant smell.—Pharm. Jour. and Trans., Nov. 1, 1885, 386.

SAXIFRAGACEÆ.

Hydrangea Thunbergii.—*Proximate Examination of the Leaves*.—Dr. K. Tamba has examined the leaves of this Japanese plant, which are characterized by a sweet taste. He has succeeded in isolating a white, crystalline body, having a composition corresponding to the formula $C_{10}H_9O_3$. It is sparingly soluble in cold or hot water, as well as in cold alcohol or ether, but easily divided by boiling alcohol or ether, in hot glacial acetic acid, in chloroform, benzol, and dilute alkalies. It is neutral in reaction, and melts at 128° .—Arch. d. Pharm., Nov. (1) 1885, 823-825.

CRASSULACEÆ.

Sedum acre.—*Value in Diphtheria, etc.*.—Dr. P. O. Wagener confirms the value of a decoction of *Sedum acre* in the treatment of membranous croup and diphtheria, for which purpose it was originally recommended by Dr. Duval. Dr. Wagener, however, seems to think that the administration of the decoction is based on a misapprehension, and, moreover, is apt to induce gastritis. He says that the value of *Sedum acre* in diphtheria does not depend upon any specific property for the cure of the disease, but upon its power of loosening the false membrane; consequently it is useless in the first stage of the disease, and should only be employed as a local application when the false membrane has been developed. The author has been in the habit of prescribing a liquid extract of *Sedum acre*, in combination with spirit of turpentine, lactic acid, and liquid extract of aconite. An application of this mixture is ordered to be made to the throat with a brush every three minutes for twenty minutes, and if by this time vomiting has not commenced, emesis is provoked, during which the membrane is said to be expelled, and has not been noticed to be re-developed.—Ther. Gaz., July 1885, 449; Phar. Jour. and Trans., Aug. 1, 1885, 107.

CUCURBITACEÆ.

Colocynth—Persian Variety.—A singular variety of colocynth has been placed upon the market, which passes under the name of "Persian colocynth." It is smaller than the Spanish colocynth, and bears evidence of having been compressed in the fresh state, so that the seeds are visible through the dried pulp. It is suggested by Mr. C. Umney that the fruits are compressed so as to lessen freight, which is regulated by volume. The proportion of pulp to seed is identical with that of the Turkey colocynth, and the microscope reveals no differences.—Pharm. Jour. and Trans., Aug. 1, 1885, 107.

Ecballium Elaterium—Reputation as a Remedy in Malarial Fevers.—The squirting cucumber is reported to grow in abundance in the environs of Tiflis and on the banks of the Kūra, and has a good reputation as a remedy in malarial fevers in Georgian popular medicine, being known under the name of "Kitrana." At a recent meeting of the Caucasian Medical Society, Dr. Minkewitch referred to the subject, and stated that the paroxysms may be arrested by the use of the drug, but that the relief is only temporary, as they return in two or three weeks. According to Dr. Linitzeff and Dr. Astvaturoff, the drug is also used as a narcotic, and is believed to be specially serviceable in cases of hydrophobia.—Pharm. Jour. and Trans., Feb. 27, 1886, 722; Med. Record, Feb. 1886, 71.

Bryonia—Poisoning.—Dr. C. Dickson reports a case of poisoning by the homœopathic tincture, which is made from the expressed juice of bryonia root, mixed with an equal bulk of alcohol. 80 minims were taken, producing symptoms resembling those from excessive doses of veratrum. The treatment consisted in giving stimulants like ammonia, coffee, and amyl nitrite, and in applying heat to the extremities.—Amer. Jour. Pharm., Feb. 1886, 88; from Austral. Med. Gazz.

Acanthasicyos horrida—Prolific Production of Edible Fruit and Seeds.—Mr. Ch. Naudin draws attention to this cucurbitaceous plant, called "Narras" by the natives of South Africa, as being particularly adapted for cultivation in desert, sandy districts in hot countries. He points out that a single plant will produce two hundred fruits, which have a white pulpy flesh, of a delicate flavor, somewhat like a watermelon, and that the seeds are also edible. It is a spiny plant without leaves, but with a long root, which has been found to extend as far as 325 feet. It lives well without rain, provided there is a certain amount of moisture within reach of its roots.—Pharm. Jour. and Trans., June 26, 1886, 1086; Gardener's Chronicle, June 5, 1886, 721.

MYRTACEÆ.

Myrtus communis—Antiseptic Uses of the Volatile Oil—Myrtol—which see under "Organic Chemistry."

Cloves—Historical Note.—Prof. Flückiger has shown (*Pharmakognosie*,

2d ed., 1883, p. 762) that cloves were known in Western Europe as long ago as the VI. century, though they may not have been a common article at that time. In spite of the proof there adduced and the account of the mediæval commerce in cloves given by Heyd (*Geschichte des Levante-handels im Mittelalter*, ii., 593-597) A. de Candolle appears to have overlooked these authorities altogether (in his work *Origine des Plantes Cultivées*, 1883, p. 129), since he asserts that cloves were unknown in Europe previous to the discovery of the Moluccas by the Portuguese. If it required another proof to show that De Candolle's statement is wrong, this proof has been recently furnished. In a stone coffin discovered on December 10, 1884, in the burial-place of the ancient Argentovaria (now Horburg, near Colmar in Elsass), and which is believed to belong to the VI. century, a small, handsome golden box was found which contained *two cloves* and a friable, amorphous, white mass. Prof. Flückiger succeeded in obtaining the contents, and identified the cloves completely. The nature of the friable mass, which had been supposed to be incense and gave out an aromatic odor somewhat resembling storax when burned, could not be determined.—*Amer. Drugg.*, March 1886, 46; from *Jour. de Pharm. d' Als.-Lorr.*, 1885.

Pimenta Leaves—Proximate Examination.—Mr. William Warner Abell has subjected the leaves of *Eugenia Pimento* to proximate examination. On distilling 448 gm. of the ground leaves with water for 36 hours, the distillate treated with ether yielded only half a fluidrachm, or rather less than $\frac{1}{2}$ per cent. of volatile oil, resembling that of *Myrcia acris*. The estimation of tannin was attempted by precipitating the concentrated infusion with basic lead acetate, decomposing the precipitate with hydrosulphuric acid and evaporating, which gave 0.417 per cent. The ash amounted to 11.25 per cent., one-eighth of which was soluble in water. The author has also prepared a number of pharmaceutical preparations, such as *abstract*, *solid* and *fluid extract*, *troches*, etc., which see under "Pharmacy."—*Amer. Jour. Pharm.*, April, 1886, 163; from the author's thesis.

Eucalyptus—Review of History, Species, etc., in Use in Medicine.—Mr. Joseph Bosisto reviews the history, botanical character, physical character, chemical constituents, medicinal uses, and products of the different species of *eucalyptus*. He also reviews the uses and character of the different pharmaceutical preparations that have been introduced, those of consequence being referred to under separate headings in this report.—*Austral. Jour. Pharm.*, Jan. 1886.

Eucalyptus—Fast Growing Species.—Mr. C. Naudin states that he has now under cultivation an undetermined species of *Eucalyptus*, which grows twice as fast as *E. globulus*. Although it is only five and a half years old it is already 37 feet high and more than 3 feet in circumfer-

ence, and is now beginning to flower. It is a very handsome tree of pyramidal form. He remarks that more attention is paid to *E. globulus*, although there are several species which are more hardy in northern climates, as for instance *E. Gunnii*, *E. coccifera*, *E. coriacea* and *E. polyanthema*.—Gard. Chron., Aug. 3, 1885, 167; Pharm. Jour. and Trans., Aug. 29, 1885, 188.

Eucalyptus globulus.—*Development of the Leaf*.—Mr. Groszlik has made some experiments on the development of the leaf of *Eucalyptus globulus*. In the youngest stage the tissue of the leaf between the epidermis, with the exception of the vascular bundles, consists of a uniform tissue composed of cells equal in diameter in each direction, which the author calls primitive mesophyll. If the leaves are forced to remain in the horizontal position, they develop the usual leaf structure of palisade cells on the upper, and spongy tissue on the lower side of the leaf; but if the leaves assume the vertical position, palisade cells are developed on both sides of the leaf next to the epidermis. He therefore concludes that there is in leaves a tissue which is capable of differentiation, and that under the influence of light there is a tendency to form palisade tissue, while shade favors the formation of spongy tissue.—Gard. Chron., March 13, 1886, 338, from Bull. de la Soc. Bot. de France.

Kino.—*Proximate Analysis of a Variety from Eucalyptus maculata*.—Mr. E. Norton Grimunde has subjected a specimen of Australian kino, the product of the spontaneous exudation from *Eucalyptus maculata*, to proximate examination. The kino was quite crude, containing much foreign matter, such as bark, quartz, etc. Rectified spirits dissolved about 80.85 per cent. of the substance; cold water, 18.9 per cent.; warm water a slightly higher percentage. It contained about 7.07 per cent. of volatile constituents, chiefly water, but including a trace of volatile oil having the odor of the kino and strongly resembling that of styrol. The result of two estimations determined the kino to contain only about 10 per cent. of tannin, of the variety peculiar to kino, which indeed responds to the tests for kino given for that substance by Flückiger and Hanbury.—Pharm. Jour. and Trans., June 26, 1886, 1102.

Syzygium Jambolanum, De Cand.—*Medicinal Virtues of the Fruit*.—The fruit of this tree is stated by Banetralla to have been used with good results in glycosuria, causing within 48 hours after its administration a considerable decrease in the amount of urine, and a complete disappearance of sugar. The rind of the fruit is said to contain the active principle.—Amer. Jour. Pharm., Sept. 1885, 488; "Rev. de Thérap." "Lond. Med. Record."

ROSACEÆ.

Rubus Chamamorus.—*Reputed Value as a Diuretic, and Proximate Examination*.—Dr. Popoff has subjected the cloud berry—locally called

“moroshka”—to proximate examination. The berries have a great reputation as a household diuretic in Russia, being commonly employed by steeping or boiling them with water, more rarely as a tincture made with whiskey (vodka). Both the berry and the calyx are employed in these preparations. The author endeavored unsuccessfully to separate an alkaloid from the drug, but he has succeeded in separating an acid as an almost colorless, flocculent powder, slightly soluble in water, easily in alcohol, and producing a crystallizable salt, easily soluble in water. It is readily prepared by infusing the freshly gathered berries in hot spirit acidulated with hydrochloric acid, filtering, passing through animal charcoal, cooling, and diluting with water, when the acid is precipitated in flakes. The author found by experiments upon animals that the acid possesses diuretic properties, and regards it as the active principle.—Pharm. Jour. and Trans., Feb. 27, 1886, 722.

Blackberry Bark—*Qualitative Proximate Examination*.—Mr. Andrew C. Santee determined in the root bark by qualitative tests the presence of tannin, gummy matter, sugar, little resin, and a saponin-like body, which was not isolated.—Amer. Jour. Pharm., March 1886, 118; from the author's thesis.

Eriobotrya japonica—*Proximate Constituents of the Fruit and Seeds*.—Dr. Peckolt communicates the results of his examination of the fruits of *Eriobotrya japonica*—popularly known under the name of

Loquat, which, although a native of Japan and China, flourishes in Brazil. In the flesh of the fruits he finds as the more important constituents: 5.034 % of sugar, 1.674 % of free organic acid, 0.455 % of citric acid in combination, and 0.145 % of a yellowish resinous coloring matter. In the seeds: 0.416 % of a fat of the consistence of soft tallow, 0.160 % of a brownish resin, 0.150 % of amorphous amygdalin, and 1.300 % of bitter extractive matter. He finds an infusion of the leaves (1:8), taken in tablespoonful doses every two hours, to be very efficient in diarrhœa. It is said that the tincture is employed with excellent results in indigestion.—Zeitschr. d. Oest. Apoth. Ver., Jan. 1, 1886, 13.

Eriobotrya japonica—*Poisoning by the Seeds*.—Although it has been known since 1876 that the seeds of the loquat contain prussic acid, cases of poisoning by eating the fruit have rarely occurred. A case of poisoning has recently been reported in France, in which a child of ten years ate a number of the seeds, and nearly lost its life in consequence. Emetics and the usual antidotes to hydrocyanic acid poisoning were administered, and the child ultimately recovered.—L'Union Phar., 1885, 354; Phar. Jour. and Trans., Aug. 29, 1885, 188.

Quillaya Bark—*Occurrence and Separation of Quillaic Acid*.—See *Saponin* under “Organic Chemistry.”

LEGUMINOSÆ.

Leguminosæ—*Distribution of Crystals of Oxalate of Calcium in Different Species*.—Prof. J. P. Borodin has made some interesting investigations into the distribution of crystals of oxalate of calcium in the leaves of *Leguminosæ*, which when further extended may serve as a clue to the plant to which a leaf under examination may belong. The conclusions arrived at after the examination of almost 660 species indicate that in the *mimosæ* the occurrence of the crystals is very constant, and that they are disposed in a solitary manner parallel to the veins. In the *caesalpinea* the distribution is the same, but there are also clusters of crystals scattered through the parenchyma of the leaf. In the *Papilionæ*, crystals are altogether absent, and in the *Genistæ* and many *Galegæ*, as *Astragalus* and *Colutea*, etc. In the *Vicæ* and *Trifoliacæ* clino-rhombic crystals are present along the veins, and in some *Phascoleæ* and *Gategæ* similar crystals are scattered through the parenchyma. In *Dioclea* and *Canavalia* crystals of similar character lie in groups in the epidermis, and in *stylosanthes* in the membrane of the epidermis. In plants in which crystals are deficient in the leaves they are also absent from the stem.—Pharm. Jour. and Trans., Oct. 31, 1885, 369; Jour. Micr. Soc., 1885, 823.

Acacia Melanoxylon—*Formation of Gum*.—Mr. G. Kraus has investigated the formation of gum in *A. Melanoxylon*. He finds that it takes place only in the bark and not in the wood, that it flows from the sieve tubes and the cells of the soft bast, and that it is not a product of the degradation of cellulose, but is a true cell content passing out through unchanged cell walls.—Pharm. Jour. and Trans., April 3, 1886, 840; Jour. Roy. Micro. Soc., 1886, 90.

Mezquite—*Products*.—Mr. Herman J. Schuchard draws attention to the uses to which the different products of the mezquite—seeds, wood, gum, etc.—are put. The wood, which takes an excellent polish, is not suited for building purposes, but furnishes an unsurpassed fuel. The gum contains 12.6 per cent. of moisture, and on ignition leaves 2 per cent. of ash; this yields to water 26.229 per cent., containing potassium and a small amount of sodium, while hydrochloric acid dissolves 73.442 per cent., containing mainly calcium (about one-half the weight of ash), with small amounts of magnesium and aluminium. The gum is free from starch, and by boiling with hydrochloric acid is converted into glucose.—Amer. Jour. Pharm., Nov. 1885, 542–543.

Senna Leaves—*Characters, etc., of the Peculiar Sugar, Sennit*, which see under “Organic Chemistry.”

Balsam of Tolu—*Prevention of the Luminosity of Phosphorus by its Preparation*.—It has been hitherto observed by Vauquelin, Adrian, Urwick, and others, that certain essential oils possess the property of preventing the luminous appearance of phosphorus in the dark. Mr.

Benoit has now added to the list the vapor of balsam of tolu and its preparations. To illustrate the phenomenon the author states that if a surface covered with a thin layer of phosphorus be placed under a bell glass together with a vessel containing a preparation of balsam of tolu, the luminosity of the phosphorus is promptly extinguished and does not reappear until some time after the removal of the glass.—*Pharm. Jour. and Trans.*, Feb. 27, 1886, 123; *Arch. de Pharm.*, i, 56.

Balsam of Tolu—*Suggestion to Use it as a Substitute for Benzoin for Preserving Ointments*, which see under “Pharmacy.”

Licorice—*Cultivation in England*.—According to “Chem. and Drug.,” the only important licorice industry in the British Isles is at Pontefract, in Yorkshire, where the soil is well suited for the growth of the plant, being of a sandy, loamy character, though, it is said, a rich black soil would answer equally as well, the only requisite being considerable depth to allow for the downward growth of the roots. Some interesting information is given in respect to the method of cultivation, collection, etc. The approximate cost of an acre of licorice on new ground is about \$450, as follows:

Trenching and preparing land	\$80
Forty thousand buds, at \$2.50	100
Planting and manure	85
Four years' rent and rates (taxes).	125
	\$390
Four years' interest on above, say	75
Total	\$465
Average produce of one acre of licorice, 45 cwt., at \$14.	\$630

This calculation is on the assumption that this is the first crop of licorice, the cost of preparing the land afterward being about one-half.—*Amer. Drug.*, Jan. 1886, 12.

Beans—Presence of a *Diastatic Ferment*, which see under “Organic Chemistry.”

Copaiba—*Examination of Commercial Sorts, etc.*—Mr. E. Proël has made an extended examination of the copaiba of commerce, viz., five samples of Maracaibo, three samples of Para, three of Angostura, and one each of Bahia, Cartagena, and Maturin balsam. For comparison, also, two samples of Gurjun balsam (*Bals. Dipterocarpi*) were subjected to the same treatment. The author's results are given in the form of tables: Table I. showing the physical character of the balsam; Table II. the action of different solvents; and Table III., the action of reagents upon them. The author's paper is concluded with a discussion of the various methods for determining the admixture of the copaiba with fixed oils, Gurjun balsam, turpentine, sassafras oil, and colophonium. He finds the

specific gravity of the balsam to vary between 0.916 (Para) and 1.009, the latter being in the instance of crude Angostura containing some water, the next highest being a sample of Maracaibo=0.995. The percentage of resin varied between 23.87 (Para) and 61.43 (Maracaibo). The specific gravity of the oils separated by distillation varied between 0.897 and 0.908. The copaibas were all completely soluble in bi-sulphide of carbon, chloroform, amyl alcohol, and benzol, but their solubility in ordinary alcohol varied, 1 part requiring from 12-25 volumes of alcohol for solution. Ether dissolved nearly all of them in all proportions, and the same was the case with ether alcohol. The author's conclusions respecting the detection of the adulterants above named will be consulted with interest.—Arch. d. Pharm., October (1 and 2) 1885, 735-754 and 769-779.

Baptisia tinctoria—*Principal Constituents*.—Dr. von Schroeder has determined the principal constituents of the root *Baptisia tinctoria* to be:

1. *Baptisin*, a glucoside, insoluble in water, which is physiologically an indifferent, bitter substance.

2. *Baptin*, also a glucoside, soluble in water, crystallizing in needles, which is physiologically slightly purgative.

3. *Baptitoxine*, an alkaloid, having a poisonous action even in small doses. In frogs it produces cessation of the respiration and then paralysis; in warm-blooded animals it causes a slowing of the respiration and an increase in the reflex irritability of the medulla.—Phar. Jour. and Trans., Oct. 21, 1885, 366; Chem. Ztg., Oct. 14, 1885, 1481.

Spartium Scoparium—*Process for Preparing Sparteine and Physiological Action of Sulphate of Sparteine*, which see under "Organic Chemistry."

Trigonella Fœnum Græcum—*Presence of three Alkaloidal Bodies in the Seeds*.—Mr. Jahns has discovered in foenugreek seeds two, or probably three alkaloids, one of which proved to be identical with "*choline*," the second is a well-established new alkaloid, which the author has named "*trigonelline*," while the third is not well established.

Trigonelline was obtained in colorless prisms, having a faintly saline taste, and the composition represented by the formula $C_7H_7NO_3 + H_2O$. It is described as hygroscopic and easily soluble in water, sparingly soluble in cold alcohol, freely soluble in hot alcohol, and insoluble in ether, chloroform or benzol. The solutions of the free alkaloid are neutral, but it combines with hydrochloric, sulphuric and nitric acids to form crystallizable salts, the solutions of which have an acid reaction.—Pharm. Jour. and Trans., Nov. 28, 1885, 447; Ber. d. D. Chem. Ges., xviii, 2518.

Goa Powder—*Presence of an Active Constituent besides Chrysarobin*.—Mr. Charles Rice, in reply to a query respecting the difference in the chrysarobin now and formerly supplied, the method of its preparation, the character of the Goa powder of the market, and the presumable pres-

ence of an active constituent in Goa powder distinct from chrysarobin, states that the first three points can either not be answered or require further study. As to the last point he draws attention to the fact that Dr. Lesser, of Leipzig, has obtained from the mother liquors from which chrysarobin had been separated, an amorphous substance, which appears to contain a principle considerably more active than chrysarobin.—Proc. N. Y. State Pharm. Association, 1886, 175-177.

Jequerity—Character of Active Constituent.—Messrs. Bruylants and Venneman have isolated from jequerity seeds a soluble immediate principle, named by them "*jequeritin*," to which, and not to a microbe, they attribute the irritant properties of the drug. They are of the opinion that this principle is formed during the germination of the jequerity seed, like diastase in the malting of barley.—Med. Times, July 18, 1885, 73; Phar. Jour. and Trans., Aug. 1, 1886, 105.

Messrs. Béchamp and Dujardin regard the above view only partly true. They found that the jequerity seeds, whether before or after germination, when decorticated, pulverized and macerated in water, yielded a solution from which 95° alcohol threw down a precipitate that after being separated and dried, was nearly soluble in water, and corresponded to "*jequeritin*." On nearer examination, however, it was found to be a mixture. The addition of acetic acid to the solution threw down a substance analogous to legumin, insoluble in water, and inactive. The filtrate from which this substance was separated, yielded, upon the addition of alcohol, a new substance, entirely soluble in water, and possessing the characteristic physiological activity of the drug. The authors name this substance "*jequerity zymase*." When dried it is slightly yellowish; its aqueous solution is not coagulated by heat, and it liquefies starch.—Compt. Rend., ci., 70; Phar. J. Trans., Aug. 1, 1885, 106.

In a second communication the above authors observe that the microzymes that have been observed in preparations of jequerity seed possess the inflammation-exciting properties of jequerity zymase, and like it are capable of liquefying starch; also that they can pass into the bacterial form, the bacteria being capable of producing the same symptoms, but that when the bacteria are allowed to develop in a filtered infusion of jequerity or a solution of jequerity zymase in contact with air, these preparations lose their activity.—Compt. Rend., ci., 190; from Ibid.

Andira inermis, Kunth—*Medicinal Use of the Bark.*—The bark of this West India tree is again recommended as an anthelmintic by Midy. For use an ounce of the bark is boiled in a quart of water until the decoction has become of a wine color, the average dose for an adult being two ounces. It should be administered in small doses gradually increased, the occurrence of nausea being regarded as proof that the maximum dose has been attained; in overdoses it is said to be narcotic. The active principle is said to be a glucoside, *andirin*.

This bark has been known and occasionally medicinally employed since the middle of the eighteenth century. Hüttenschmidt (1824) isolated from it an alkaloid which was named *jamaicine*, but was by Gastell (1866) shown to be identical with berberine. The name *andirin* was given by Peckolt (*Archiv d. Phar.*, 1858, vol. 146, p. 38) to a brown-yellow coloring matter, which may perhaps be identical with berberine, and which was obtained from the wood of *Andira anthelmintica*, Benth. In addition to this the wood contains a soft pungent and bitter resin, soluble in ether and alcohol, but insoluble in chloroform; this it seems has drastic and anthelmintic properties, and is also contained in the seeds, which are used in Brazil for their vermifuge properties under the name of *angelim amargosa*.—*Amer. Jour. Pharm.*, Nov. 1885, 558; *Nouv. Remèdes*.

Enterolobium Timbouva, Mart.—*A New Saponaceous Vegetable*.—Professor Licopoli draws attention to this plant as possessing saponaceous properties similar to those of quillaya bark, soap root, etc. It is widely diffused throughout South Brazil and Uruguay.—*Pharm. Jour. and Trans.*, June 26, 1886, 1086; *Nature*, June 17, 1886, 159.

Gymnocladus canadensis—*Toxic Action of the Seeds*.—Prof. R. Bartholow, of Philadelphia, reports the preliminary results of experiments with the *Gymnocladus canadensis*, or Kentucky coffee-bean, a concentrated aqueous extract having been employed. The toxic properties of the drug have already been observed, flies having been stupefied by it, and these experiments, reported in the *Amer. Jour. of Med. Sci.* for April, show that the drug has powers analogous to those of Calabar bean.

Rosewood—*Probable Botanical Source*.—Although Brazilian rosewood has been used in Europe for possibly three hundred years, its botanical source is still unknown, although it is generally referred to one or more species of *Dalbergia*. This uncertainty is the more remarkable from the fact that the trees are said to be abundant in all the Eastern provinces, from Pernambuco to Rio de Janeiro. An attempt has now been made by Mr. A. Galletly, the curator of the Edinburgh Museum of Science and Art, to throw some light on its origin by examining the resins and resinous coloring matter contained in Brazilian and Honduras rosewoods, as well as those of the Indian woods of the genus *Dalbergia* which resemble the rosewood, viz.:

Dalbergia latifolia and *D. Sissoc.* From the experiments made, it appears that the extracts obtained by means of ether, naphtha and alcohol are nearly the same in all, both in character and quantity, naphtha extracting about 1½ per cent. of matter from the wood, ether about 4, and alcohol about 14 per cent. The alcoholic extract has a strong tinctorial power, one part in 100,000 showing a distinct color in a test tube. Other woods gave different results, ebony yielding hardly any color to ether or alcohol, and mahogany a tincture of far less colorific power.—

Pharm. Jour. and Trans., Feb. 27, 1886, 723; Gard. Chron., Feb. 20, 1886, 297.

TEREBINTHACEÆ.

Melanorrhæa laccifera, Pierre—*New Species*.—Mr. Pierre gives an account of a new species of *Melanorrhæa*, which yields a kind of lacquer, and to which he has given the name of *M. laccifera*. The tree is a native of Indo-China, and the lacquer is obtained from it in the same manner as it is in Burmah from *M. usitata* and *M. glabra*, viz., by softening the bark by beating it with a mallet and then thrusting in a pointed bamboo as far as the cambium, the exuded juice being emptied out of the bamboo into a closed vessel every three days so as to prevent oxidation. In these vessels it is preserved by covering it with a layer of water or Gurjun oil; if water is used it is changed every three days. The timber is also said to be valuable for furniture, the tree being used for cabinet work more than for producing lacquer.—Pharm. Jour. and Trans., April 3, 1886, 840; Bull. Mens. de la Soc. Linnéenne de Paris, No. 68, 537.

Iringia Oliveri, Pierre—*Occurrence and Nature of the Fat in the Seeds*.—Mr. J. B. Vignoli gives an account of the *cay-cay*, a species of *Iringia* found in the forests of Sarynih, Cochin China. As in the instance of *I. Barteri*, of Western Africa, the seeds contain a large percentage of fat, the quantity amounting to 52% of the dried seeds. It is easily saponifiable, yielding 52.7% of fatty acids, of which 30.2% is oleic acid. The natives use the fat for candles, but the author considers that it might prove useful in soap-making.—Pharm. Jour. and Trans., April 3, 1886, 840.

PIPERACEÆ.

Piper methysticum—*Action of the Resinous Extract of the Root as a Local Anæsthetic*.—Dr. Lewin has made a most interesting series of observations upon the physiological effects of a resinous extract obtained from the root of *Piper methysticum*, which is soluble in alcohol, possesses a somewhat aromatic taste, and leaves upon the tongue a sensation of pricking and burning, soon lost in the supervening local insensibility. When the extract, even in very small amount, is instilled into the eye of an animal, a slight local irritation is evidenced by repeated blinking, which soon yields to a marked, enduring, and complete insensibility of the conjunctiva and cornea. In guinea-pigs Lewin has seen this insensibility continue for more than an hour, normal sensation gradually returning. The iris retains throughout its reflex responsiveness to optic stimuli. No anatomical lesions of the cornea or conjunctiva were observed as the result of its application. When the solution of the extract is injected hypodermically, the tissues with which it comes in contact completely cease to respond to the application of thermic, electric, and chemical stimuli—a transitory condition which is followed by no symptoms of in-

inflammation. In regard to the constitutional effects produced by the drug upon man, much the same claims are put forward as in the case of coca.—*Amer. Jour. Pharm.*, March 1886, 138-139: from *Med. News*, Feb. 13, 1886.

In a lecture delivered before the Berlin Medical Society, Dr. Lewin gives in resumé some further information as to the constituents of "kava-kava." Besides the two non-crystalline bodies previously observed, one of these known as "kawahin," the other now designated "yangonin,"—both now also being determined to be inactive—he has obtained by extracting the root with alcohol a greenish-brown mass, from which two resins were separable by petroleum spirit. One of these, which the author names *alpha resin*, is soluble in petroleum spirit, by which it is left on evaporation as a yellowish green, oily thin fluid substance, having the characteristic smell of kava-kava. It is also easily soluble in alcohol, and, in the author's opinion, is the chief active constituent. The second resin—*beta resin*—possesses very little physiological activity, and even this little is possibly due to adhering alpha-resin.—*Phar. Jour. and Trans.*, May 1, 1886, 917.

Methysticum—*Description of the Root*.—Prof. Otto A. Wall gives an interesting description of the external and microscopic character of *Kava-kava* or *Ava kava*, the root of *Piper methysticum*. The paper is accompanied by excellent cuts showing the different characters described, but cannot be profitably abstracted, and is too lengthy to find place here in its entirety. Reference may be had to the original in *The Pharmacist*, Sept. 1885, 265-269.

RHAMNACEÆ.

Rhamnus Purshiana—*Isolation of a Distinct Crystalline Principle*.—A student of the California College of Pharmacy has obtained from this bark small orange-red crystals which, after purification from alcohol, were found by Prof. Wenzell to sublime at 230° C. They dissolve in sulphuric acid with a deep red color without showing a green tinge, and though resembling frangulin to some extent, do not appear to be identical with this compound; neither are they identical with emodin. The principle will be further examined by Prof. Wenzell.—*Phar. Rundschau*, N. Y., 1886, 79.

AQUIFOLIACEÆ.

Ilex Cassine—*Proximate Examination*.—Mr. F. P. Venable has examined some leaves of *Ilex Cassine*, procured from New Berne, N. C., in 1883, and found them to yield 0.32 per cent. of caffeine. More recently he obtained a larger supply of the same leaves gathered in the neighborhood of Wilmington, and subjected them to proximate examination, with the following results:

Water in air dried sample	13.19
Extracted by water	26.55
Tannin	7.39
Caffeine	.27
Nitrogen (on combustion)	.73
Ash	5.75

An ash analysis was made, and is compared in the following table with an ash analysis of the leaves of *Ilex Paraguayensis* by Senor Arato, the latter being shown by column II:

	I.	II.
CaO	10.99	12.34
MgO	16.59	11.29
Na ₂ O	.47	7.28
K ₂ O	27.02	2.98
MnO ₂	1.73	2.50
Fe ₂ O ₃	.26	3.41
SO ₃	2.50	.92
Cl	.66	.71
P ₂ O ₅	3.34	5.54
SiO ₂	1.32	44.75

—Amer. Jour. Pharm., Aug. 1885, 389, 390; from Jour. Amer. Chem. Soc., 1885.

Ilex paraguayensis.—*Collection and Varieties of Paraguay Tea*, "Yerba," in Commerce, etc.—Mr. Henry Dauber has read an interesting essay on "Yerba," before the Liverpool Chemists' Association, in which he gives some interesting details relative to its history, method of collection, preparation for the market, etc., for which reference must be had to the original paper. Three sorts of yerba are prepared, namely, *caa-cuy*, *caa mirim* and *caa-guaza*; the prefix "*caa*" denoting leaf in the Guarani language.

Caa-cuy.—This consists of the new leaves from the small branches, dried in the summer. It is consumed on a very small scale, is of a brownish-green color, and is rarely exported, as it invariably loses its aroma very rapidly, consequently being of little value on reaching its destination. This variety contains no stalks.

Caa mirim is the leaf carefully separated from the stalk and dried. It preserves its aroma longer than *caa cuy*, but the demand for it is limited.

Caa-guaza, or "*Yerba de Palos*," is composed of both leaves and stalks, which have gone through the drying process, and is well known on account of preserving its aroma for a considerable length of time. The author has subjected this last variety of "yerba" to analysis with the following results:

The sample was composed of 64% of leaves and 36% of stalks. The preliminary examination showed it to contain 9.407% of moisture (lost

at 100°C.); 8.920% of matter extracted by ether; 51.667% of soluble vegetable matter; 18.406% of woody fibre; and 11.6% of ash. The ash contained: Carbonic oxide, 11.724%; sand (insoluble in HCl), 1.224; silica, 10.413; P_2O_5 , 10.421; SO_3 , 1.413; ferrous oxide, 0.250; alumina, 1.310; lime, 28.163; magnesia, 12.304; potassa, 8.672; soda, 12.122; and chlorine, 1.984%. The drug contained the following organic constituents: Yerbine (the caffeine of former writers), 3.355%; tannic acid, 5.220%; volatile oil, 0.064%; fat, 1.711%; chlorophyll, 2.064%; wax, 0.420%; resin, 3.800%; sugar, 4.031%; dextrin, 1.160%; albumen, 4.510%; soluble carbohydrates, 34.252%.—Pharm. Jour. and Trans., May 29, 1886, 1017-1019.

EUPHORBACEÆ.

Euphorbiacæ—*Division into Groups According to the Degree of Development of Latex Tubes*.—According to Mr. F. Pax the degree of development of latex tubes may be used to divide the natural order of the *Euphorbiacæ* into four groups, viz.:

1. That in which the latex vessels are wanting, the fluid being distributed through the cells of the parenchymatous tissue.
2. That in which the latex tubes are divided into segments of equal lengths.
3. That in which they are divided into unequal lengths.
4. That in which they are unsegmented, this occurring in the true *Euphorbie*.—Pharm. Jour. and Trans., Oct. 31, 1885, 370; Jour. Micr. Soc., 1885, 825.

Euphorbia pilulifera—*Physiological Properties, etc.*—Mr. Eloy finds this drug to be without any modifying action on the sensory or motor nerves, and he considers that it has no direct action on expectoration or in allaying cough, but that its usefulness in bronchitis, etc., is due to its stimulating action on the heart and respiratory organs, when given in moderate doses. The author gives the tonic dose for an animal as 1 gram for 100 grams of the animal. The tincture is prepared from 1 part of the dried herb to 5 parts of proof spirit, and may be given in doses of 10 to 30 drops.—Pharm. Jour. and Trans., Jan. 30, 1886, 644; Rép. de Pharm., Jan. 1886, 7.

Euphorbia piulifera—*Value as a Pulmonary Medicament*.—Prof. Dujardin-Beaumetz speaks highly of this plant as a succedaneum to iodide of potassium in the treatment of pulmonary complaints. The active principle is an acrid resin which is soluble in water and dilute alcohol. When the aqueous extract or the hydro-alcoholic extract is administered to animals, such as frogs or guinea-pigs, it is observed that in the case of frogs this extract is toxic in the dose of ten to fifteen centigrams, which corresponds nearly to five grams of the dried plant to one hundred grams of the weight of the animal. In the guinea-pig the toxic dose is less; the

animal succumbing to a dose of fifty or sixty centigrams of the extract, equivalent to about one gram of the dried plant per one hundred grams of the animal's weight. As to its physiological effects, it may be noted that it acts chiefly on the respiratory apparatus, and that to a period of acceleration succeeds a period of retardation of the respiratory movements and beatings of the heart; hence, it is probable that this medicine acts directly on the respiratory and cardiac centers.

The author refers to the following preparations:

1. The hydro-alcoholic *extract*, which may be given in the dose of 10 centigrams per day.
2. The *decoction* (one-half ounce in two quarts of water), in the dose of three or four wineglassfuls a day.
3. The *tincture* (strength not given, Rep.), the dose of which is 10 drops three times a day.
4. The *syrup*, which is made by Petit in the proportion of 5 centigrams to the tablespoonful.—Amer. Jour. Pharm., March 1886, 141-143, from Med. News, Feb. 20, 1886.

Cascarilla Bark—*Proximate Examination*.—In view of the different characters ascribed to the bitter constituent of cascarilla bark by Duval and by Alessandri, the former having obtained a non-nitrogenous, the latter a basic crystalline principle, Mr. R. A. Cripps has undertaken the examination of the bark, and communicates the following as his preliminary results:

1. <i>Petroleum Extract.</i>		
Volatile oil	1.832	
Fixed oil	0.164	
Resin	3.099	
		5.095
2. <i>Chloroform Extract.</i>		
Resin	10.485	10.485
3. <i>Alcoholic Extract, etc.</i>		
Tannin, starch	} unexamined	64.722
Mucilage, wood		
Fibre, alkaloid, etc }		
4. <i>Ash.</i>		
CaCO ₃ , KCl, Ca ₃ (PO ₄) ₂ , Fe ₂ O ₃ , NaCO ₃ , K ₃ PO ₄ , etc . .		9.580
5. <i>Moisture</i>		10.118
		100.000

—Pharm. Jour. and Trans., June 26, 1886, 1102, 1103.

Cascarilla Bark—*Occurrence of a Substance Closely Allied to Choline.*

—Dr. Boehm has obtained from cascarilla bark, besides the already known constituents, namely, an inert volatile oil, and the crystalline bitter substance cascarilla, an alkaloid closely allied to

Choline.—He has also found that the crystalline cascarilla, which is

very resistant to chemical action and insoluble in most solvents, is converted by prolonged boiling in water into an amorphous resinoid modification, which still retains the properties of a nerve poison pertaining to the crystalline body in large doses.—Phar. Jour. and Trans., Oct. 31, 1885, 366; from Pharm. Post, Oct. 24, 1885, 1151.

Copalchi Bark—(*Croton niveus*, Jacq.)—*Proximate Examination*.—Mr. E. Schmidt gives a description of the physical and microscopical characters of copalchi bark, which was many years ago (1817) introduced into European commerce under the name of Trinidad or Cuba cascarilla. Proximate examination revealed the presence of a bitter principle, soluble both in water and in alcohol, and of a resin. The aqueous infusion of the bark has a yellowish, and the alcoholic tincture a brown color.—Pharm. Jour. and Trans., May 1, 1886, 917; Rép. de Pharm., April, 1886, 157.

Croton argyranthemum, Michaux,—*Supposed Medicinal Value, etc.*—Prof. J. M. Maisch draws attention to this species of *Croton*—one of the few species of this extensive genus growing in the United States. His attention had been directed to it by the statements of a Georgian farmer as to its great value in cramp colic, diarrhœa, and numerous other ailments. The author gives a botanical description of the plant, and observes that judging from the physical properties of the plant it probably does not possess any decided or very important medicinal virtues; still, in view of the reputation enjoyed by a number of the woody species of the same genus, it seems to be deserving of investigation. This was suggested more than twenty years ago by Prof. F. P. Porcher, in his “Resources of the Southern Fields and Forests;” the plant specially mentioned by him, *Croton maritimum*, is likewise covered with a silvery scurf, but it is confined to the coast districts, and has broadly oval and subcordate leaves.—Amer. Jour. Pharm., Dec. 1885, 597-599.

Stillingia sylvatica—*Analysis of the Root*.—Mr. William Bichy has subjected the root of *Stillingia sylvatica* to proximate examination. The important constituents separated are a disagreeably smelling volatile oil and an alkaloidal principle which the author proposes to name

Stillingine.—Though evidently not obtained quite pure, the new substance appears to form a crystalline sulphate. The author sums up the results of his analysis as follows:

Moisture	15.50
Ash	5.00
Benzol extract (resin, fixed and volatile oil, coloring matter)	5.00
Alcoholic extract (tannin, alkaloid, resin)	21.98
Aqueous “ (gum)	2.75
Acid “ (starch).	23.73
Alkali “ (coloring matter).	6.55
Cellulose	20.06
Total	100.57

—Amer. Jour. Pharm., Nov. 1885, 529-531.

Mercurialis perennis, Lin.—*Medicinal Uses*.—This plant was formerly employed in medicine, like the less active *Mercurialis annua*, Lin. In 1863, E. Reichardt isolated from both plants the volatile alkaloid *mercurialine*, which, in 1877, was ascertained by E. Schmidt to be identical with monomethylamine; besides which, also, ammonium salts and trifling quantities of trimethylamine are present. The alkaloid in the form of hydrochlorate, and administered by hypodermic injection, was recently found by Dr. Hugo Schulz (Arch. f. experim. Pathol. u. Pharmak., 1886, p. 88), to produce no decided effect; but the herb, as well as the fluid extract, given to pigs and rabbits, caused paralysis of the muscles of the bladder with diuresis and diarrhoea. The plant is known to contain a chromogene yielding a blue coloring matter resembling indigo. Whether the physiological action of the plant is due to this principle, as Dr. Schulz believes, or to some other compound, has not been established.—Amer. Jour. Pharm., June 1886, 301.

Shellac—*Process of Making*.—Mr. J. Bosisto has witnessed the preparation of shellac in India, and describes it as follows:

The first part of the process is to separate the lac from the twigs. This is done by two women—one turning and the other feeding a primitive-shaped wooden mill. When a heap is formed (about a bushel in quantity), it is winnowed in a rustic-looking winnower, the lighter *debris* separating; the remainder is then hand-picked. The process of grinding and winnowing is repeated until the whole is reduced to small, orange-colored nodules. When in this condition it is termed seed-lac; the bright garnet-colored pieces, being few in number, are now picked out and set aside for native ornaments. The seed-lac is then placed into a large earthenware pan, and with it some water. A woman steps into the pan, steadying herself against the mud-wall with her hands, then turning violently to the right and left, in order to keep the lac in a continual state of motion against her feet and the sides of the pan for some time, the other woman occasionally adding more water, until the vessel is full of a dark-colored liquid. After settlement, the dye water is removed into another earthenware pan, and the lac again washed until the water runs away clear.

Lac Dye.—The treatment of the colored water for the purpose of obtaining from it the lac dye is very simple. After straining, lime water is added which precipitates the dye. The water is then drawn off, and the dye drained through cotton cloth; from this it is transferred to compressible frames, containing strong iron plates, and reduced by a native screw-press to solid sheets of dark purple dye, about a quarter of an inch thick; these are cut into cakes and stored until dry enough for packing, and then forwarded to Calcutta for sale in the bazaars. The utilitarian value of lac dye over cochineal in a humid climate, especially

in dying the scarlet cloth of the soldiers' coats, lies in its power to resist the action of human perspiration.

Shellac.—The manufacture of shellac is an entirely distinct process. The seed-lac at the bottom of the pan is removed, dried and sifted. The finer dust, which is highly inflammable, is removed. The lac workers of India make it up into bracelets and ornaments of various kinds.

The coarse lac which is to be made into shell is put into long sausage-shaped bags of about two inches diameter, made of cloth like American drill. Under a shed is a charcoal fire about two feet long and six inches wide; alongside of the fire-place is a bamboo pole about three feet long and four inches in diameter, filled with warm sand, inclining at a slight angle to the ground. On each side of the fire-place a man is sitting, but more generally a woman, each holding an end of the sausage-roll-looking bag about twelve inches over the clear charcoal fire, turning the roll or bag briskly until the lac begins to ooze through the interstices of the cloth; the bag is still kept twisted until a coating of soft lac covers the outside. It is then removed from the fire, and a small disc of lac is placed here and there over the surface of the bamboo by a rapid turn of the wrist. A third woman is sitting at one end of the bamboo, holding in both hands a strip of aloe leaf, resembling very much a thin magic wand; this she pushes forward over the soft lac, repeating the motion three or four times, when a thin film of the lac covers the round surface of the bamboo, which is immediately transferred into an open basket; the lac, drying rapidly, cracks up into many pieces—this is shellac.

Button-lac is simply shellac without spreading.

Sheet-lac is made in a similar manner to shellac, only the sheets are much thicker, and the woman removing it from the bamboo in a supple condition, and with both hands, stretches it over the fire, in order to remove the wave-like furrows which are impressed on it by the fibrous surface of the aloe leaf. While doing this it is not uncommon to see the woman—who performs her work intelligently—lift the hot sheet to her mouth and bite out any foreign substance, such as dirt or sand, filling in the hole so made by a rapid movement of her hand over the sheet. The average rate of wages is an anna and a quarter ($1\frac{7}{8}$ of a penny) per day.—*Australas. Jour. Pharm.*, 1886, p. 49.

“*Oro*” *Plant*—*Botanical Relation*.—Mr. W. Thiselton Dyer has had opportunity to examine cuttings of the plant used by the prisoners of the Freetown Gaol, Sierra Leone, for the purpose of simulating illness, and known as the “*Oro*” plant. The plant has been described as a *cactus*, but it has been suggested as more likely that it is one of the cactus-like *Euphorbias*, and the specimen examined by the author leaves it beyond a doubt that the “*Oro*” plant belongs to the *Euphorbiaceæ*. In the absence of flowers the exact species is indeterminable.—*Pharm. Jour. and Trans.*, April 17, 1886, 879.

URTICACEÆ.

Nettle—Distinct Character of the Poison.—The irritating poison contained in the hairs of different species is generally regarded to be formic acid in the free state. Prof. G. Haberlandt, in an essay presented to the Academy of Natural Sciences, at Vienna, February 4, 1886, has shown that the irritation is produced by a poison which is dissolved in the cell sap, and the behavior of which proves it to be related to the formless ferments, or enzymes.—*Amer. Jour. Pharm.*, May, 1886, 252.

Hops—Process for the Preservation of Active Constituents.—Mr. Boubée has devised a process for the preservation of the active principle of hops intended for brewers' use, which consists in separating mechanically the lupulin from the strobiles, exhausting the strobile deprived of the lupulin with boiling water, evaporating to dry extract, and mixing intimately the lupulin and dry powdered extract. The mixture is enclosed in tin cans, in which air is replaced by carbonic acid. In this condition it is said to keep indefinitely.—*Pharm. Jour. and Trans.*, May 1, 1866, 921; *Compt. rend.*, cil., 833.

Hops—Active Bitter Principle.—In continuation of his experiments which resulted in the isolation of the bitter principle of hops (see Proceedings 1884, 330), Dr. Bungener has obtained results that convince him that the bitter acid compound previously isolated by him is really the bitter principle of hops. While the unchanged principle is insoluble in water, its oxidation products dissolve rapidly in water by the aid of heat, and impart to it intense bitterness.—*Chem. News*, May 5, 1886, 275.

Hops—Supposed Presence of a Mydriatic Principle.—A writer over the initials of L. A. J., communicates to *Amer. Drugg.* (May 1886, 81), some interesting observations, which seem to point to the presence of a mydriatic principle in hops, having an action similar to atropine, and probably volatile.

Hops—Occurrence of Asparagin, which see under "Organic Chemistry."

Lupulin—Examination of Commercial Samples.—Mr. J. S. Ward reports the results of the examination of four samples of lupulin, all of which were characterized by their grittiness. He found their yield to ether 54.24, 41.49; 40.04 and 39.41% respectively, and to yield the following percentages of ash in the same order: 27.01, 29.10, 30.86 and 31.42. He considers these samples to fairly represent the commercial article of the present day.—*Pharm. Jour. and Trans.*, June 30, 1886, 656.

Ficus Carica—Peptonizing Ferment in the Milky Exudation.—Dr. A. Hausen confirms the statements of previous experimenters that the latex of the common fig contains a peptonizing ferment. It resembles pepsin in its effect upon fibrin and the coagulation of milk, and produces the diastatic reaction of the conversion of starch into sugar. A syrup made

from dried figs has the same peptonizing properties as the latex, which suggests its possible usefulness for children as an adjunct to starchy foods.—Pharm. Jour. and Trans., Aug. 1, 1885, 108.

CONIFERÆ.

Abietinææ—*Characters of the Resin Acids*.—Mr. Perrenoud, in a paper on the resin acids of the abietinææ, refers specially to *abietinic* and *pimaric acids*, the former of which is known as occurring in American colophonium and the latter in galipot. He states that he has found abietinic acid in the stem resin from *Pinus Picca* and *P. Strobus*, as well as in the root resin from *P. sylvestris*, and that in the stem resin of the latter he has found pimaric acid. These two acid resins are isomers, both being represented by the formula $C_{40}H_{64}O_4$; but whilst the ammonium salt of abietinic acid is gelatinous, the acid ammonium salt of pimaric acid crystallizes in handsome needles. There is also a difference in the melting points, abietinic acid melting at $165^{\circ}C.$, and pimaric acid at $148^{\circ}C.$ —Pharm. Jour. and Trans., Oct. 31, 1885, 366; Pharm. Centralh., October 8, 1885, 483.

Spruce-Gum—*Examination*.—Mr. Adolph F. Menges has subjected the so called spruce-gum—the balsamic exudation of *Abies nigra*, Poir., and not of *A. alba*, Michx., or *A. canadensis*, Michx., as sometimes stated—to proximate examination. His results show this substance to differ in many respects from the other balsamic exudations of *Conifera*, which have as yet been chemically examined. By distillation a *volatile oil* was separated, constituting when pure and dry a colorless, limpid liquid, having a rather agreeable terebinthinate odor, specific gravity 0.85, boiling point $160^{\circ}C.$, and evidently a simple terpene $C_{10}H_{16}$. The aqueous distillate has an acid reaction, due to butyric acid. There appear to be two resinous constituents differing from colophony and other wine resins. A crystalline resin could not be obtained.—Contrib. Dep. Phar. Univ. Wisc., No. 2 (1886), 30-34.

Pinus sylvestris, Lin., and *P. excelsa*, Lk.—*Comparative Experiments with their Resins*.—Mr. Hirschsohn has made comparative experiments with authentic specimens of the resins obtained from these two species of pinus, and reports that in their solubility in alcohol and the behavior of the alcoholic solutions towards acetate of lead the two resins are alike; but that they may be easily distinguished by their behavior towards ether, chloroform, and solution of ammonia, carbonate of sodium, and borax. The resin of *P. sylvestris* dissolves completely in these solutions; that from *P. excelsa* only partially. Furthermore, the resin from *P. excelsa* when precipitated from its sulphuric acid solution by water, forms red-violet flocks, whilst in the case of the resin from *P. sylvestris* the precipitate is white.—Pharm. Jour. and Trans., Oct. 3, 1885, 289; from Phar. Zeitsch. f. Russl., xxiv., 534.

Cyprian Turpentine—*Collection at Papho, Characters, etc.*—Mr. W. T. Thiselton Dyer gives some interesting information respecting Cyprian turpentine, communicated to him mainly by the British commissioner at Papho, where this kind of turpentine is exclusively produced. The trunks of the trees are hacked and the gum collected in May and June. It is allowed to filter through brushwood or a coarse cloth, and is then boiled and strained. The boiling has to be done over a very slow fire, or else the gum will explode. After straining, the gum is again boiled with a little water added to it. It is boiled until all the water has evaporated, and is then in such a state that it will not stick to anything. It is finally poured into a vessel of cold water and kneaded. At first it is of a dirty yellow color, but after kneading becomes quite white. It forms irregular masses. The total produce is estimated at 80 okes (224 lbs.) annually. The gum has the reputation among the natives of being a mild aperient, and taken internally is a cure for various forms of syphilis; applied externally it is supposed to be a cure for leprous sores.—Pharm. Jour. and Trans., Nov. 7, 1885, 385.

UNCLASSIFIED DRUGS.

Tupelo Root—*Value for Dilatation of the Uterine Cervix.*—Dr. Ménérier regards the tupelo root as preferable to sponge or laminaria for the following reasons:

1. Tupelo acquires its maximum degree of expansion in less than an hour and a half, while sponge and laminaria require from six to seven hours.
2. Its surface remains soft, pliable and spongy, and in extracting it there is no danger of injury to the mucous membrane.
3. It returns with facility to its former size and shape, and may be used several times if subjected to disinfection in mercuric chloride after each operation.—Gaz. de Gyn., Jan. 1, 1886; Amer. Jour. Pharm., March 1886, 152. This is the root of *Nyssagrandidentata*; see Amer. Jour. Phar., Dec. 1883, p. 631.

Njimo Wood—*Alleged Digestive Properties.*—Dr. Schulz has subjected this wood—which has been imported into Germany from the country beyond the Cameroons, and has the reputation of possessing digestive properties—to examination. It occurs in pieces of stem wood, sparingly covered with bark, and in sections of a cylindrical root uniformly covered with bark, the inner parts of both the stem and the root being of a beautiful yellow color. Nothing is known as to the botanical origin of the drug. It has an odor resembling musk, and a strong pure bitter taste. Infusions were prepared both with hot and cold water; but neither these, nor the alcoholic tincture (which has a beautiful fluorescence), possessed any digestive action whatever.—Pharm. Ztg., June 12, 1886, 350.

B. ANIMAL DRUGS.

Sponges—Preparation for Surgeons' Use.—Mr. Lawson Tait's method of preparing sponges is as follows: New sponges are first put into a large quantity of water with sufficient muriatic acid to make the water taste disagreeably acid. They remain in this mixture until all effervescence has ceased and all the chalk is removed. For this purpose it may be necessary to renew the acid several times. The sponges are afterward carefully and thoroughly washed, to make them as clean as possible and free from every rough particle. After being used at an operation, they were first washed free from blood, and then put in a deep jar and covered with soda and water (one pound of soda to twelve sponges). They are left in this about twenty-four hours (or longer if the sponges are very dirty) and then they are washed perfectly free from every trace of soda. This takes several hours' hard work, using hot water, squeezing the sponges in and out of the water and changing the water constantly. Leaving them to soak for a few hours in very hot water greatly assists in the cleansing. When quite clean, they are put in a jar of fresh water containing about one per cent. of carbolic acid; after being kept in this way for twenty-four hours they are squeezed dry and tied up in a white cotton bag, in which they are left hanging from the kitchen ceiling till they are wanted.—*Amer Drugg.*, Jan. 1886, 4; from *Amer. Journ. of Obstet.*

Insects—Varieties Found to be Injurious to Drugs.—Mr. Frithiof Kumlien has examined the insects that have been found to attack certain drugs injuriously. He finds that *cantharis* is attacked by the larvæ of *Anthrenus scrophulariæ* and *A. varius*. *Castor* also suffers from the larvæ of the last named species as well as from the *Acarina*. Drugs of vegetable origin are mostly affected by the *Lepidoptera*. One of the most injurious is the moth belonging to the family of *Tineidæ*, one of the lower species of which lives on *flaxseed meal*. The larvæ of a small beetle belonging to the *Ftinidæ* destroy *capsicum* and *allspice*, whilst the former is also eaten by the larvæ of *Larioderma serricorne*. The mites—*Chieletus*, *Troglyphus*, etc., attack drugs of all kinds, and even the cockroach contributes its mite to the destruction of drugs. As a remedy, the author observes that the eggs and larvæ of most of the insects injurious to drugs may frequently be destroyed by exposing the drug to the temperature of boiling water; the more matured insects can generally be killed by benzin. When practicable a weak solution of carbolic acid also proves very efficient.—*Contrib. Dep. Pharm. Univ. Wisc.*, No. 1, 1885, 39-41.

Cochineal—Cultivation and Collection in Guatemala.—An interesting account of the raising and collection of cochineal in Guatemala, taken from the "Montreal Daily Star," will be found in *Pharm. Jour. and Trans.*, Nov. 14, 1885, 414.

Cochineal—Chemical Examination.—The conflicting statements re-

specting the coloring matter in cochineal led Professor Liebermann to investigate the subject of the constituents of that drug. It is difficult to determine the full quantity of coloring matter contained in the insect, in consequence of the persistence with which it is retained by the animal matter. But an attempt was made to estimate it by exhausting a weighed quantity of cochineal as completely as possible with boiling water, precipitating the coloring matter from the filtrate as a lead compound, decanting, drying, determining the quantity of lead in an aliquot part, and deducting the calculated amount from the total weight of the whole. This would give the maximum possible quantity of coloring material, which in the case of very good silver cochineal was 14%; but the product always contained at least one-third its weight of impurity, and the real average was estimated at from 9 to 10%, a large quantity of coloring matter being always left in the residue. The nature of the coating of the silver cochineal was also investigated and found to consist of a peculiar wax, which the author has named

Coccerin. It is soluble in benzol, but nearly insoluble in ether, has a high melting point (106° C.), and is represented by the formula $C_{30}H_{60}$ ($C_{31}H_{61}O_3$)₂. Coccerin was always found in the black varieties as well, though in smaller quantities, confirming the idea that the silvery coating is an indication of more careful treatment of the insect.

Cochineal carmine was examined and found always to yield nitrogen, a part of which was considered to be probably derived from albumen or isinglass used in the preparation, but a part undoubtedly from protein substances forming an integral part of the compound. The ash showed also a large proportion of alumina and lime, and the author looks upon carmine as a compound of the coloring matter with alumina, lime and protein. It is noteworthy that the two bases appear to be present in almost exactly the same proportions as those in which they have been found to combine with Turkey red. Ber. d. Deutsch. Chem. Ges., xviii., 1969–1975; Pharm. Jour. and Trans., Aug. 29, 1885, 186, 187.

Since making his above experiments the author has had opportunity of examining some live insects received *in situ* on the

Opuntia coccinellifera. He observes that the fleshy stems appeared at a first glance to be covered with a dense filmy vegetation, underneath which, upon closer inspection, the perfectly white coated motionless cochineal insects could be seen. The apparent fibres consisted of fine threads and particles of wax, almost entirely soluble in benzol, which had exuded from the wax glands in the skin of the insect, a cluster of the threads occurring mostly at the hinder end of the abdomen. No winged male insects were present, but there were numberless small white egg-shaped punctured cocoons from which they had escaped. These consisted of three-fourths their weight of nearly pure coccerin, leaving when treated

with benzol only a thin net-work having the shape of the cocoon, together with the debris of the insect. Coccerin was also readily obtained by treating the female insects with benzol.—Pharm. Jour. and Trans., April 3, 1886, 839; Ber. d. D. Ch. Ges., xix., 328.

Trehala—Proximate Examination.—This substance, which is used as food in Syria, has been investigated by Guibourt (1858), Berthelot and Hanbury. It is a cocoon formed upon a species of Echinops by a beetle which has been named *Larinus nidificans*, Guibourt, *L. subrugosus*, Chevalat, and *L. maculatus*, Faldermann. The same substance has now been further examined by Dr. G. Apping. His chemical analysis yielded moisture 10.78, ash 2.79, fat and chlorophyll 0.16, trehalose 23.84, tannin and citric acid traces; albuminoids soluble in water 8.09, soluble in soda 1.88, and insoluble in both liquids 2.31; cellulose like substance derived from starch 24.90; true starch 6.72; mucilage soluble in water 7.60, and mucilage insoluble in water 10.93. The most important constituents, trehalose, starch and mucilage, were fully examined, and inquiries were made into the origin of trehala. The cocoon is a product of the larva, but the material for this structure, although of vegetable origin, cannot have been derived from the plant upon which it was built, since Apping found the pith and other portions of the tissue of the stems to be entirely free from starch and from trehalose, while the granules detected in portions gnawed by the larva were observed to be outside of the cell walls; these microscopic observations were verified by Professor Russow.—Amer. Jour. Pharm., Aug. 1885, 403; from the author's thesis, Dorpat, 1885.

Honey—Poisonous Character Imparted by the Flowers of Gelsemium sempervirens.—It is reported in "Gaillard's Journal" that honey has been rendered poisonous by the bees visiting the flowers of *Gelsemium*, and that a number of persons were poisoned by wild honey at Branchville, S. C., of whom three died. The honey on examination gave evidence of containing gelsemium. Shortly after partaking of it the persons, some twenty in number, complained of giddiness, and but for prompt medical assistance all of them would have died.—Pharm. Jour. and Trans., Aug. 29, 1885, 188.

Honey—Prevention of Crystallization.—Mr. J. W. Ridpath has endeavored by suitable experiments to answer the query "how to prevent the crystallization of honey by unobjectionable means." He finds himself unable to answer this question definitely, notwithstanding he has made numerous experiments, finding the nearest approach to a remedy to consist in keeping the honey in a moderately warm place, and, on the first signs of crystallization, to melt at a low temperature and to add a little glycerin.—Proc. Penna. Pharm. Assoc., 1886, 202-204.

Bees' Wax—Simple Method of Extraction.—A correspondent in Gard-

ener's Chronicle (Nov. 14, 1885, 623), gives the following simple method for extracting the wax in clear form direct from the comb. The wax is placed into a copper with hot water, a hoop that will fit into the copper is covered with a cheese cloth and fastened down into it, below the level of the surface of the water. The melted wax rises through the cloth to the surface, and forms a perfectly clean cake on cooling.—Pharm. Jour. and Trans., Nov. 28, 1885, 448.

Bees' Wax—Determination of Purity.—Mr. C. L. Lochman contributes a paper on the methods of determining the purity of bees' wax. A simple method, as contemplated by the propounder of the query, to which Mr. Lochman's paper is a reply, is not available. The author's paper cannot be abstracted without more detail than is justified for this report, and reference must therefore be had to the original in Proc. Penna. Pharm. Assoc., 1886, 204-205.

Cobra Poison—Chemical Character.—Dr. R. Norris Wolfenden read a paper before the Royal Society, December 17, 1885, in which he demonstrated that the venom of the East India cobra (*Naja tripudians*, Merr.) does not contain any alkaloid or poisonous acid, but that its poisonous properties reside in the albuminous constituents, and that, with the removal of the latter or their destruction by means of potassium permanganate, the poisonous properties disappear. The venom contains three varieties of albumins. Two of them, globulin, which is the largest quantity, and syntonin, act upon the respiratory centre; while the third, serum-albumin, which exists only in very small quantities, probably produces paralysis of the motor centres. Whether the poisonous properties of these albumins are due to some peculiarity of the constitution, or whether some hypothetical poison is linked with albumins of ordinary constitution, has not been ascertained; but the possibility of the proteids of the venom being themselves poisonous, is rendered more probable by the observations of Schmidt-Mühlheim and Albertoni, who have shown that ordinary peptone, injected into the blood, may produce poisonous effects, causing a remarkable fall in blood-pressure, and destroying the coagulating power of the blood.—British Medical Journal, Jan. 9, 1886.

Ivory—Bleaching and Coloring.—The following is given in "Rundschau" (xi, 723) in reference to bleaching and coloring ivory: After removing the fat by means of ether or benzin, the ivory is bleached with a mixture of equal parts of commercial peroxide of hydrogen and water, washed with water and dried. To color ivory, it is first treated with benzin or ether to remove the fat, then soaked for two minutes in a 1 per cent. solution of hydrochloric acid, washed, and allowed to remain in the warm coloring-liquor for fifteen or thirty minutes. Coloring liquors are made as follows: *Red*—Fuchsin 10 grams, water 3 liters, vinegar 100 grams; or eosine 5 grams, water 1 liter, tartaric acid 2 grams. *Violet*—Methyl-violet 2 grams, water 1 liter, tartaric acid 3 grams. *Blue*—

Methyl-blue 2 grams. *Green*—3 grams Victoria or brilliant green, water 2 liters, vinegar 100 grams. *Yellow*—Naphthol-yellow 8 grams, water 2 liters, vinegar 300 grams.—*Amer. Jour. Pharm.*, Jan. 1886, 18.

INORGANIC CHEMISTRY.

GENERAL SUBJECTS.

Chemical Elements—Relation of their Specific Gravity to their Specific Heat, etc.—Mr. J. L. Keller read a very interesting paper before the Virginia Pharmaceutical Association (1886), in which he gives the details of experiments made to show that there is a distinct difference between the specific gravities and atomic weights of elements, and between their specific heat and atomic weights. The observation furnishes to the chemist valuable methods for checking doubtful atomic weights, and for determining the atomic weights of those not within the reach of other methods.—*Pharm. Rec.*, June 1, 1886, 176.

Solubilities in Water and in Alcohol of Some Official Chemicals.—Prof. F. B. Power communicates an interesting series of experiments made to determine the solubilities of some official chemicals, the details of which were carried out under his direction by Messrs. F. A. Scheuber, O. A. Kropf and E. Naffz. The results are given in the form of a table, as follows, giving a comparison with the statements on the same subject in the U. S., German, and French Pharmacopœias:

	WATER.					ALCOHOL.				
	U. S. Pharm.	Phar. Germ		Pharm. Fran- cise.	Messrs. S. K. and N.	U. S. Pharm.	Phar. Grm	Pharm. Fran- cise.	Messrs. S. K. and N.	
		Text.	Table.				Text.	Table.		
Acidum Boricum	25.	25.	30.	30.	22.27	15.	15.	20.	16.	21.55
Acidum Carbolicum.	20.	20	20.	16.	13.44					
Acidum Citricum	0.75	0.54	1	0.75	0.53	1.	1.	1.	1.80	1.74
Acidum Salicylicum.	450.	538	600.	413.22	758	2.5			2.37	2.31
Acidum Tannicum	6	1.	5.	6.	very soluble.	0.6	2.	2.	0.6	
Acidum Tartaricum.	0.7	0.8	1.	0.66	0.71	2.5	2.5	4.	2.43	1.97
Albumen	10.5	10.5	12.	10.5	9.05					
Ant et Potass. Tart.	17	17.	20.	14.	17.6					
Argentii Nitras	0.8	0.6	1.	1	0.54	26.	10.2	12.	10.	19.54
Hydrarg. Chlor. Corros.	16.	16.	20.	15.2	21.98	3	3.	3.	3.61	5.98
Plumbi Acetas	1.8	2.3	3.	1.69	1.87	8.	28.6	30.	8.	4.32
Potass. Bitartras	210.	192.	200.	250.	213.33					
Potass. et Sodii Tart	2.5	1.4	2.	1.2	1.53					
Potassii Iodidum	0.8	0.75	1.	0.71	0.71	18.	12.	12.	18.	11.73
Potassii Permangan.	20.	20.5	25.	15.15	20.66					
Potassii Sulphas	9.	10	12.	9.46	7.8					
Potassii Tertras.	0.7	1.4	2.	4	0.57					
Sacchar. Lactis	7	7.	7	5.	5.42					
Sodii Boras	16	17.	18	22.	27.09					
Sodii Phosphas	6	5.8	10.	4.	6.09					
Sodii Sulphas	2.8	3.	4.	2.80	2.85					
Zinci Sulphas.	0.6	0.6	1.	0.74	0.73					

—Contrib. Dep. Pharm. Univ. Wisc., No. 1 (1885), 24-31.

OXYGEN.

Oxygen Gas—Preparation.—Mr. Walter Hempel describes an apparatus for preparing oxygen gas, which he had seen during a visit to the United States several years ago, but the originator of which he could not ascertain. The apparatus consists of a cast-iron generator, with ground cover, which is made tight by asbestos packing and clamps. Into the cover is fitted a tube, of about $1\frac{1}{8}$ inch internal diameter, ending in a funnel above, and having a lateral branch for conducting off the gas. The tube is connected with the gasometer by means of a rubber or glass tube. When starting the operation, about 50 gm. of chlorate of potassium is poured in the funnel, and allowed to fall into the apparatus by opening the faucet (which should have a bore of at least $\frac{3}{4}$ inch). The fire is then started, and as soon as the oxygen gas commences to be given off, which may be recognized by a glowing match being rekindled when held down in the funnel, the faucet is closed, and the gas collected. When the current of the latter diminishes, which is recognized by the diminished flow of water from the gasometer, a fresh supply of 50 gm. of the chlorate is put into the funnel, and made to fall into the retort by rapidly opening the faucet. This mode of operating has the advantage that at no time are large quantities of chlorate acted on at once. After a short time, such an amount of chloride of potassium has been formed, acting as diluent, that no danger is encountered even if the gas is given off very violently.—Amer. Drugg., Oct. 1885, 185; from Ber. d. Deutsch. Chem. Ges., 1885, 1440.

Oxygen—New Form of Apparatus for its Preparation.—Dr. Robert Muencke describes a new form of apparatus for the generation of oxygen, which permits the employment of chlorate of potassium unmixed with other substances. It also enables the operator to interrupt the generation of gas at will, and to start it again at any moment. It consists of an iron tube twelve inches long and one and a half inches internal diameter, closed at one end and open at the other. Near the closed end a smaller tube, internal diameter five-sixteenths of an inch, forms the exit tube of the developed gas. The open end, after the interior has been filled half full of powdered chlorate of potassium, is closed by means of a cap and clamp. The inclosed salt is then evenly divided by shaking or tapping the tube, and heat applied by means of a sliding burner, beginning at the end closed by the cap.—Amer. Drugg., Nov. 1885, 207; Chem. Ztg., No. 63, 1885.

HYDROGEN.

Hydrogen—Industrial Production.—Messrs. Hembert and Henry describe a process for the industrial production of hydrogen at a very low cost. It consists first in projecting fine jets of super-heated steam upon incandescent coke contained in a retort heated to redness; in the pres-

ence of the carbon the water is decomposed, equal volumes of hydrogen and carbonic oxide being produced. The mixed gases are then caused to circulate through a second retort heated to redness, in which masses of refractory material are arranged so as to produce a maximum of contact. Jets of steam, superheated to the point of dissociation, are introduced simultaneously, when the carbonic oxide combines with the oxygen of the water to form carbonic acid, setting free another volume of hydrogen.—Pharm. Jour. and Trans., Nov. 28, 1885, 448; Compt. Rend., ci, 797.

Hydrogen—Preparation.—Mr. Schwarz describes methods for the preparation of pure hydrogen and carbonic oxide. When a mixture of zinc dust with calcium hydrate, prepared by slacking lime with a little water, sifting and drying at 100°C ., is heated in a combustion furnace from behind forwards, a regular evolution of very pure hydrogen takes place according to the equation: $\text{Zn} + \text{CaH}_2\text{O}_2 = \text{ZnO} + \text{CaO} + \text{H}_2$.

If the zinc dust be mixed with an equal molecular weight of calcium carbonate, then, under the same conditions, nearly the theoretical quantity of pure carbonic oxide is obtainable.—Phar. Jour. and Trans., June 26, 1886, 1088; Ber. d. D. Chem. Ges. xix, 1140.

Water—Official Characters.—Mr. August Drescher subjects the tests of the U. S. Pharmacopœia for the purity of water to a critical review, and suggests more accurate detail in the requirements, respecting the color, residue, the presence of carbonic acid, nitrites, ammonia, metals, etc. See Pharm. Rec., June 1, 1886, 175; from Proc. New Jersey Pharm. Assoc., 1886.

Potable Water—Suitable Conditions.—The International Pharmaceutical Congress adopted the following resolutions in reference to drinking water: 1. It should be clear, colorless, odorless, and free from suspended matter. 2. It must be fresh, have a pleasant taste, and a temperature not over 15°C . 3. It should contain air and a certain amount of carbonic acid. The air it contains must contain 30–33 per cent. oxygen. 4. It should not contain more than 20 milligrams of organic matter to the liter (determined by oxalic acid) and should be free from nitrogen. 5. The nitrogenous organic matter oxidized with potassium permanganate should not yield more than 0.1 milligram albuminous nitrogen to the liter. 6. It should not contain more than 0.5 milligram of ammonia in each liter. 7. A liter of water should not contain more than 0.5 gram of mineral salts, 60 milligrams anhydrous sulphuric acid, 8 milligrams chlorine, 2 milligrams anhydrous nitric acid, 200 milligrams oxides of the alkaline earths, 30 milligrams of silica and 3 milligrams of iron. 8. Drinking water should not contain any nitrites, sulphuretted hydrogen or sulphides, nor should it contain any metallic salts which are precipitated by sulphuretted hydrogen or ammonium sulphide, excepting traces of iron,

aluminium and manganese. 9. When kept in closed or open vessels it should not acquire a disagreeable odor. 10. It should not contain any saprophytes, leptotrix, leptomites, hyphotrix, and other white algæ, numerous infusoria and bacteria. 11. It should not become mouldy on the addition of white sugar. 12. When cultivated on gelatin, no bacteria which liquefy the gelatin should be formed within 8 days.—*Amer. Jour. Pharm.*, Jan. 1886, 17.

Potable Waters—Purification.—The process given by Prof. Almén is recommended by Prof. Th. Husemann. To 1 liter of water add 3 cc. of a 5 per cent. solution of chloride of iron and also a quantity of lime-water corresponding to the hardness of the water, about 50 cc. The resulting brown precipitate is a basic iron salt and hydrated iron-oxide, which may be separated by straining or filtering through sand. 40 to 80 per cent. of the dissolved organic matters, besides the suspended organic matters, are said to be precipitated by this process.—*Schweiz. W. f. Ph.*, No. 21, 1885; *Amer. Jour. Pharm.*, Sept. 1885, 435.

Water—Removal of Micro-Organisms.—Mr. Percy F. Frankland has reported to the Royal Society of England a series of experiments upon the purification of water containing micro-organisms, which has many features of practical importance. The method of investigation consisted in determining the number of organisms present in a given volume of the water before and after treatment, the determinations being made by Koch's process of gelatin-culture on glass-plates. Of the substances experimented with, only green-sand, coke, animal charcoal and spongy iron were found to wholly remove the micro-organisms from water filtering through them, and this power was in every case lost after the filters had been in operation for one month. With the exception of the animal charcoal, however, all these substances, even after being in action for one month, continued to remove a very considerable proportion of the organisms present in the unfiltered water, and in this respect coke and spongy iron occupy the first place. The results obtained by agitating water with various solid materials show that a very great reduction in the number of suspended organisms may be accomplished by this mode of treatment, and the complete removal of all organisms by agitation with coke is especially worthy of notice. The results obtained with Clark's process show that we possess in this simple and useful mode of treating water a means of greatly reducing the number of suspended organisms. Thus, although the production in large quantities of sterilized potable water is a matter of great difficulty, involving the continual renewal of filtering materials, there are numerous and simple methods of treatment which secure a large reduction in the number of organisms present in water.—*Amer. Drugg.*, Sept. 1885, 169; from *Nature*.

Distilled Water—Removal of Nitric Acid and Ammonia.—In at-

tempting to prepare distilled water from impure water containing nitrous acid or ammonia, it will generally be found that these impurities pass over into the distillate. This may be prevented, according to Hager, by the use of permanganate and alum. If the water contains ammonia, this must be first removed by the addition of 0.15 to 0.3 per cent. (of the weight of the water) of potash-alum. Afterwards the nitrous acid may be oxidized by adding about 0.5 per cent. of a dilute solution of permanganate of potassium (1 in 1,000). The nitrous acid is converted into nitric, and combines with the potassium of the permanganate.—Pharm. Centralh., No. 13, 1886.

Water—Filtration of Large Quantities.—Mr. Cocone proposes to filter the water through a layer (about 25 or 35 cm. thick) of a mixture of 1 part of oxide of iron and 2 parts of sand.—Phar. Rundschau, xii, 213.

Peroxide of Hydrogen—Preparation.—Mr. James Kennedy has found the following process for the preparation of peroxide of hydrogen to give the most satisfactory results: Place tribasic phosphoric acid (U. S. P.) in any convenient quantity into a shallow porcelain vessel immersed in a freezing mixture (ice and salt), and when the temperature has fallen to 40° F. or below, saturate with peroxide of barium, previously made into a thick paste with water; when completely saturated, filter through pure filter paper. The vessel must be shallow to allow large contact of the freezing mixture; the peroxide of barium must be added very slowly, and until the mixture shows slight alkaline reaction. The excess of barium may be removed by sulphuric acid and refiltration.—Pharm. Rec., May 15, 1886, 148.

NITROGEN.

Nitrous Oxide—Administration.—Some years ago Dr. S. Klikovitch, following the suggestion of Dr. Paul Bert, made some experiments on himself, with a mixture of nitrous oxide and oxygen, in the proportion of 80 to 20, without any increase of atmospheric pressure, with a satisfactory result. He also used it for alleviating the pains of labor, and found it very successful and perfectly safe; the great objections to it being its expense, and the cumbersome nature of the required apparatus. Some months ago Professor Zweifel, of Erlangen, erected the necessary apparatus for the supply of the mixed gases to the accouchement-ward of his obstetric clinic. He finds it best to administer the gases continuously during the latter part of labor, when the pains are most severe, not, as was practiced by Klikovitch, merely giving the gases when signs of an approaching pain appeared. Though this treatment has been adopted in sixty cases, no retardation of the process was ever observed. The patients were generally semi-conscious; so that though they would answer if asked a question, they felt no pain, and were unaware when the child was born.—Amer. Drugg., Jan. 1886, 3; from British Med. Jour.

Laughing Gas—Generation of a Steady Stream.—Mr. Kaemmerer recommends the following method of procedure: In a Woulff bottle are placed some strips of copper, and the bottle is filled about one-third full with a cold saturated solution of nitrate of sodium, to which concentrated sulphuric acid is very gradually added. The flow of gas is regulated by the quantity of sulphuric acid added, care being taken not to have the mixture too warm.—Pharm. Rundschau, xii, 110.

Binoxide of Nitrogen—Supposed Disinfectant and Germicide Properties.—A Spanish professor, having observed that none of the workmen in an electrotyping establishment in Madrid died from cholera during the epidemics of 1834, 1859 and 1865, was led to make some investigations, which demonstrated the fact that liquids from dead bodies on being treated with binoxide of nitrogen soon lost their peculiar smell and remained free from micro-organisms. In thirty-five cases of cholera it is said to have been used successfully by a French naval surgeon.—Pharm. Jour. and Trans., May 1, 1886, 920; Lancet, April 10, 1886, 709.

Nitrogen Acids—Reagents.—Dr. H. Hager has found diphenylamine to be a very delicate reagent for nitrogen acids (see Diphenylamine, under "Organic Chemistry"). He also finds that *Naphthol*, $C_{10}H_7(OH)$, is a delicate reagent for the detection of nitrates and the nitrogen acids, though not as delicate as diphenylamine. Hager succeeded in detecting 1 in 5,000, and obtained a fainter, but still distinct reaction with 1 in 8,000 parts. The solution for use contains 1 part of naphthol in 100 parts of strong or absolute alcohol. For applying the test, place in a test-tube of 1.2 cm. width, 3 or 4 cc. of the colorless (or nearly so) suspected liquid; mix with 2 cc. of the above solution, and add carefully 1.5 to 2 cc. of pure concentrated sulphuric acid, as stated under diphenylamine. Suddenly, or in a few seconds, the acid surface assumes a yellow, reddish brown or brownish black coloration. For the detection of traces of the acids (1 in 5,000), add at first but 1 cc. of pure sulphuric acid; after a minute, shake and mix; then add with care 1.5 cc. of pure sulphuric acid, and wait 1 to 2 minutes, when the surface of the acid shows a dark color. After 4 or 5 minutes shake well, to mix the fluids, which, if the nitrogen acids were present in very slight traces, will have a decidedly yellowish color. By adding sulphuric acid in three portions a yellowish color, resembling that of white wine, is obtained with $\frac{1}{8000}$ HNO_3 .—Amer. Jour. Pharm., Oct. 1885, 503; from Ph. Centralh., 1885, p. 353.

Nitric Acid—Use of Pyrogallie Acid as Reagent.—Prof. Chas. O. Curtman draws attention to the following test for nitric acid, which is quite delicate, even more so than the diphenylamine test. To a cubic centimeter of the water to be examined about a milligram, or even less, of pyrogallie acid is added. The test tube is slightly inclined, and ten

to twelve drops of concentrated pure sulphuric acid are added, so that two layers are formed. In the presence of nitric acid a brown color is developed at the point of contact of the two fluids or, in case of exceedingly small amounts, only a yellow color is observed when the two layers are mixed and the contents of the test tube are viewed from above against an underground of white paper.—Pharm. Rundschau, June 1885, 152.

Nitric Acid—Use of Ammonio-Ferrous Sulphate as a Test.—Mr. Rosa recommends to use the green sulphate of iron and ammonium, protosulphate of iron and ammonium, ammonio-ferrous sulphate which is used by photographers as a developer, in place of the crystallized sulphate of iron as a test for nitric acid. It is more stable than the latter, either in substance or in solution. It is used in the same manner as ferrous sulphate. Equal volumes of the liquid to be tested for nitric acid, and of concentrated sulphuric acid are mixed, the mixture cooled, and then a layer of the solution of ammonio-ferrous sulphate poured cautiously on top. Even if only $\frac{1}{1000}$ part of nitric acid was present, a brown zone will form at the line of contact of the two liquids.—Amer. Drugg., Jan. 1886, 13, from Gaz. Chim. Ital. and Chem. Zeit., 1885.

SULPHUR.

Sulphur—Solubility in Hot Alcohol.—Mr. A. G. Bloxam draws attention to the fact, often overlooked, that sulphur is soluble in hot alcohol, and that this should be borne in mind now that vulcanized rubber stoppers are commonly used in the laboratory. Hot alcohol coming in contact with such stoppers would be capable of dissolving out the sulphur.—Chem. News, April 16, 1886, 181.

Precipitated Sulphur—Commercial Quality.—Two samples of precipitated sulphur, examined by Mr. S. W. McKeown, were found to have the following composition:

	1st.	2d.
Precipitated Sulphur	41.70	43.58
Precipitated Sulphate Calcium	58.30	56.12

The sulphur was dissolved out of a weighed quantity of the drug with carbon bisulphide, and the residue washed with ether and dried in a hot-water oven and weighed. The insoluble residue was identified as calcium sulphate by chemical tests, and as precipitated sulphate by means of the microscope. Four other samples were ignited on a crucible lid. In each case a residue was left equal in bulk to the original substance. Of seven samples examined, only one was found to be pure.—Amer. Drugg., July 1886, 128; Proc. Ohio State Pharm. Assoc., 1885.

Acidum Sulphurosum—Preparation and Examination.—Mr. John Kennedy obtained unsatisfactory results by the method of the Pharmacopœia, and recommends the reduction of the sulphuric acid by means of

metallic copper, passing the gas through a cylinder containing lumps of moist charcoal, and then through a wash bottle. The process is inexpensive, inasmuch as the by-product—sulphate of copper—is readily disposed of. Six commercial samples of the acid were examined with the following results:

	Specific Gravity.	Per cent. of SO ₂ .	Per cent. of H ₂ SO ₄ .
No. 1	1.008	1.68	} Varying amounts.
No. 2	1.028	3.28	
No. 3	1.036	3.25	
No. 4	1.003	None.	0.54
No. 5	1.006	None.	0.91
No. 6	1.023	None.	2.67

The author also records some experiments made to determine a reliable volumetric method for determining the sulphurous acid in presence of sulphuric acid.—*Amer. Jour. Pharm.*, May 1886, 226–227.

Sulphurous Acid—Specific Gravity of its Solutions.—Messrs. B. Giles and A. Shearer have made numerous determinations to ascertain the specific gravities of aqueous solutions of sulphurous acid gas (SO₂), and the percentages of that substance contained therein. Their results are as follows:

Spec. Grav.	Tem.	SO ₂ in 100 pts.	Spec. Grav.	Tem.	SO ₂ in 100 pts.
1.0051	15.5° C.	0.99	1.0399	15.5° C.	8.08
1.0102	"	2.05	1.0438	"	8.68
1.0148	"	2.87	1.0492	"	9.80
1.0204	"	4.04	1.0541	"	10.75
1.0252	"	4.99	1.0597	12.5° C.	11.65
1.0297	"	5.89	1.0668	11.0° C.	13.09
1.0353	"	7.01			

The authors in conclusion state that when the determinations at 15.5° C. and 760 mm. pressure were made, the specific gravity was increased in the proportion of 0.005 for every augmentation of 1 part in 100 of the quantity of sulphurous acid gas.—*Amer. Jour. Phar.*, March 1886, 151; *Annali di. Chim. Med. Far.*, 1885, 244.

Sulphurous Acid—Estimation in Free or Combined State.—Messrs. W. B. Giles and A. Shearer, in order to overcome some of the tediousness attending the process for estimating sulphurous acid, recommend the following method:

Weigh the substance, if a solid, upon a small watch-glass, and immerse the latter in an excess of normal $\frac{1}{10}$ volumetric solution of iodine. Stir well, and in the case of difficultly soluble sulphites wait some time to give the iodine a chance to decompose the substance; then determine the excess of iodine with $\frac{1}{10}$ volumetric solution of hyposulphite. Liquids are weighed in a small tube closed by fusion, which is afterwards broken un-

der the iodine solution.—*Amer. Drugg.*, March, 1886, 48; from *Zeitsch. f. Anal. Chem.*, 1885.

Acidum Sulphurosum—Occurrence of Crystals of Silica in the B. P. Preparation.—Mr. John C. Hunter has examined some beautiful needle-shaped crystals forming a precipitate in a shop bottle of sulphurous acid, and found them to consist of silica. He infers that the silica (or possibly silicate) was produced by the action of the sulphuric acid, slowly formed by oxidation upon the glass of the bottle.—*Pharm. Jour. and Trans.*, Oct. 24, 1885, 345.

Sulphites—Constitution.—See *Mercuric Sulphites*, under “Hydrargyrum.”

Sulphuric Acid—Uses as a Disinfectant, etc.—Some of M. Pasteur's latest experiments have proved that water containing 2 per cent. of concentrated sulphuric acid possesses the property of destroying bacteria, and this mixture of acid and water is recommended for disinfecting efficaciously the floors of stables, mangers, cattle-stalls, court-yards, areas of dwellings, dust-bins, etc. Sulphuric acid, properly diluted, is a valuable cooling and astringent remedy. It is used to acidify certain decoctions or infusions. Only the dilute acid (in most countries, one part pure acid, nine parts water), is ever used medicinally. Ten to twenty-four drops of this dilute pharmaceutical acid will give an agreeable acidity to one quart of the infusion or other liquid. As many fever patients are fed principally on milk, care must be taken never to give liquids containing sulphuric acid, or acid lemonades of any kind, too soon after milk has been given, otherwise it may produce unpleasant symptoms of indigestion. In France, an alcoholized sulphuric acid is sometimes used. It is made by adding concentrated sulphuric acid, 100 parts, to alcohol (of 85 per cent.), 300 parts, and is generally colored red by the addition of 4 parts of the petals of the red poppy.

Sulphuric Acid Lemonade is made from this according to the formula:

Alcoholized Sulphuric Acid	3 parts.
Simple Syrup	60 “
Water	1,000 “

This is also known as “mineral lemonade.”—*Amer. Drugg.*, Dec. 1885, 229; from *Chemist and Druggist*.

Mineral Acids—Commercial Quality.—Mr. George Gundrum has examined fifteen samples each of sulphuric, nitric and hydrochloric acids obtained from dispensing pharmacies. *Sulphuric acid* he found uniformly running high; there being but one of the fifteen that fell below 90% (=89%). Two were C. P. acids, one of which stood the full test, whilst the other was no better than the ordinary commercial acid. The commercial *nitric acids* did not come up so favorably, being generally

weaker than required; the C. P. acids, however, were generally of good strength and quality. The *hydrochloric acids*, like the sulphuric acids, were generally of good strength. Of three samples of C. P. acid one was below the standard.—Proc. Mich State Pharm. Assoc., 1885, 123-125.

SELENIUM.

Selenite of Ammonium.—A new reagent for the determination of *codeine*, which see under "Organic Chemistry."

CHLORINE.

Chlorine—Volumetric Estimation.—Mr. E. Bohlrig describes the following method for the volumetric estimation of chlorine: The fluid to be examined is boiled with carbonate of magnesium, filtered, a measured part of the filtrate shaken with dry oxalate of silver, allowed to stand some time, and again filtered. The filtrate is then treated with sulphuric acid, and diluted with decinormal solution of permanganate (1 cc. = 0.007 gram. Cl.), a correction being made for the solubility of the oxalate of silver.—Zeitschr. f. Anal. Chem., xxiv., 408.

Chlorine Water—Decomposition by Sunlight.—It has been held heretofore that an aqueous solution of chlorine, when decomposed by sunlight, was changed to an aqueous solution of hydrochloric acid, and that oxygen was liberated. Mr. Alfred Popper, however, a short time ago (Liebig's Annalen, 227, 161), demonstrated the fact that the resulting aqueous solution, when neutralized with potassa, contained a considerable proportion of *chlorate*, besides the chloride of potassium.—The author's first experiments did not show whether the chloric acid was contained in the aqueous liquid, decomposed by sunlight, or whether it was produced during the evaporation of the neutralized solution, perhaps by the decomposition of a hypochlorite. To decide this question, and also to ascertain whether the chlorate and chloride thus obtained were always formed in definite and constant proportions, a new series of experiments was undertaken by the author. The results obtained showed that the chloric acid must have been present in the decomposed chlorine water before evaporation. It also showed that the relation of chloric to hydrochloric acid contained in the decomposed water was as 10.9 to 40.79. It follows, from the author's statements, that the reaction illustrating the decomposition of chlorine water is as follows:



In addition, there appear to be traces of a compound present—perhaps hypochlorous acid or a derivative of it—which separates iodine from iodide of potassium. Bromine water appears to decompose in precisely the same manner.—Liebig's Annalen, 231, 137.

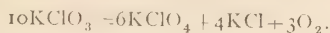
Chlorine and Bromine—Naphthol a Delicate Reagent.—Dr. H. Hager observes that chlorine or bromine gives with a 1 per cent. solution of naphthol in alcohol a whitish turbidity and precipitate, the latter assuming from chlorine a yellowish green and from bromine a yellow color. If the detection of mere traces of chlorine and bromine be the object, place in a narrow test-tube 3 or 4 cc. of the liquid to be tested, and then pour down along the side of the test-tube 0.5 cc. of the naphthol solution; in a few minutes a white turbidity will be observed between the two layers, extending when slightly shaken. If the two layers be mixed, a white opalescence or turbidity will be the result. Traces of chlorine will show, in about 15 to 30 minutes, a greenish tint; bromine, a yellowish one. Chlorine or bromine, 1 in 30,000 of liquid, will show the reaction in a few minutes; if in 40,000 parts of liquid, 10 to 12 minutes are required, and this is about the limit of dilution for this reaction. Care as to the dilution is needed: for instance, hydrochloric acid ought to be weaker than 20 per cent., nitric acid about or weaker than 10 per cent., etc.—*Amer. Jour. Pharm.*, Oct. 1885, 504; from *Ph. Centralh.*, 1885, 366.

Chlorine, Bromine, Iodine—Effect of Light on their Solutions in the Presence of Different Bodies.—Dr. Eder communicates the results of experiments upon the relative rapidity and extent of the changes produced by light upon solutions of chlorine, iodine, bromine, and the influence of the presence of organic compounds in promoting the changes in them. It was found that when exposed to light chlorine water underwent change from six to twelve times more rapidly than bromine water, and that alcoholic tincture of iodine was about one thousand times more resistant to light than chlorine water. A solution of iodine in dilute alcohol was very stable, and showed no change at the termination of the comparative experiments. Chlorine water and bromine water changed gradually in the dark also, the former more rapidly than the latter. In the presence of citric or tartaric acids the alteration of both chlorine water and bromine water was accelerated, but to the greatest degree in the light. *Pharm. Jour. and Trans.*, October 3, 1885, 285; from *Monatshefte*, vi, 495.

Chlorate of Potassium—Contamination with Sodium Salt.—Dr. F. Dronke reports having recently found some chlorate of potassium contaminated with the sodium salt. The external appearance, crystalline form, and usual reactions were apparently normal and did not excite any suspicion. On the other hand, it was noticed that the salt imparted a deep yellow color to the flame, and was soluble in about 8 parts of water. A saturated solution in water, when mixed with one of acetate of potassium, at once produced a characteristic precipitate of chlorate of potassium.—*Amer. Drugg.*, March 1885, 49; from *Chem. Zeit.*

Chlorate of Potassium.—Action on Chloral Hydrate, which see under "Organic Chemistry."

Chlorate of Potassium—Decomposition by Heat.—In a former paper Mr. Frank L. Teed had arrived at the conclusion that the decomposition of chlorate of potassium by heat may be represented by the equation,



He has continued his experiments and finds that when the salt is very gently heated the decomposition more nearly approximates to that indicated by the equation,



the majority of his results falling within the limits calculated from these two equations. As bearing on the subject, the decomposition of

Perchlorate of Potassium by heat was investigated; it appears that in the earlier stages chlorate of potassium is formed, but this disappears long before the complete decomposition of the perchlorate is effected. He finds that when the perchlorate is heated with binoxide of manganese, it decomposes apparently without any chlorate being formed. The author criticises some numbers of Baudiment having an apparent similarity to his own, and points out that Baudiment's methods of analysis must have been untrustworthy.—*Pharm. Jour. and Trans.*, Jan. 30, 1886, 658.

Chlorate of Potassium—Cause of Decrepitation Under the Influence of Heat.—Professor Madau was incidentally led to investigate the cause of the decrepitation of chlorate of potassium under the influence of heat, a phenomenon that is usually explained as being due to the vaporization of included water. The author observes that chlorate of potassium shows an inveterate tendency to form twin crystals; but he found that when a clear, transparent crystal, from which the twin plates have been ground away so as to reduce it to a film about 1 millimetre in thickness, is heated nearly to the point of fusion, no decrepitation takes place. But upon lowering the temperature to about 245°C ., a remarkable change spreads quickly and quietly over the plate, causing it to reflect light almost as brilliantly as if a film of silver had been deposited on it. When ordinary twin plates were similarly treated, decrepitation always occurred more or less violently, each fragment on cooling showing the brilliant reflective power referred to. The author considers, therefore, that the decrepitation is doubtless due to the wrenching asunder of the hemitrope plates, through their unequal expansion by heat in different directions.—*Pharm. Jour. and Trans.*, May 29, 1886, 1008; *Nature*, May 20, 1886, 66.

Sodium Chlorate—Effect of Heat, etc.—Owing to a difference of authorities as to whether chlorate of sodium when heated to melting gives off oxygen and leaves a residue having a neutral reaction, or whether chlorine and oxygen are given off and the residue has an alkaline reaction, Mr. E. Holberg made a series of investigations, from which it appears that the chlorates when contaminated with a trace of organic matter, will give off chlorine and leave a residue having an alkaline reaction.

One of the processes recommended for the preparation of sodium chlorate, is by decomposing acid sodium tartrate with potassium chlorate. The salt prepared in this way has probably caused the statement, that on heating, chlorine is given off, and the residue gives an alkaline reaction, which is due to a trace of organic matter. For this reason sodium chlorate should be prepared by a process which will exclude all possibility of contamination with organic matter.—*Amer. Jour. Pharm.*, Jan. 1886, 15.

BROMINE.

Bromine—Manufacture in Michigan.—Dr. S. S. Garrigues draws attention to the fact that bromine is now profitably prepared from the saline waters of the Saginaw Valley, Mich., and makes some pertinent remarks respecting the composition of these liquors, and the individual uses to which they may possibly be applied.—*Proc. Mich. State Pharm. Assoc.*, 1885, 139-142.

Bromine—Quantity in Sea Water.—Experiments made by Mr. Emil Berglund have shown that previous determinations of bromine in sea-water have generally furnished figures which were too high, and also, that the proportion of bromine in the water is everywhere about the same. The mean of the author's results is about 64 milligrammes of bromine in 1 liter, or 1 grain in about 34 fluidounces.—*Ber. d. D. Chem. Ges.*, xviii., 2888.

Hydrobromic Acid—Preparation.—Mr. T. S. Dymond reviews the different processes that have been suggested and are in use for the preparation of hydrobromic acid. He particularly calls attention to the B. P. process, which he considers preferable to Wade & Fothergill's, to Squibb's and to Markoe's. The B. P. process is the one proposed by Mr. Fletcher, and depends on the reaction that occurs when bromine is tested with sulphuretted hydrogen in the presence of water. The operation may be performed by passing sulphuretted hydrogen through some bromine placed at the bottom of a cylinder and covered by a column of water. This is continued until the sulphuretted hydrogen no longer effects any change, when the aqueous liquid is decanted and submitted to distillation. It has been suggested that the bromine should be previously dissolved in bisulphide of carbon, and that then the deposition of sulphur which to some extent chokes the apparatus, would be avoided; but this the author does not consider necessary. A small quantity of dark red liquid remains after the action of the sulphuretted hydrogen is completed. This is

Bromide of Sulphur.—It is a beautiful red substance, having none of the pungent properties of bromine, remains unaffected by sulphuretted hydrogen, dissolves in bisulphide of carbon in all proportions, and may be redistilled at a comparatively low temperature. It loses bromine slowly, and in the author's experience, when exposed for six months, the bromine had entirely disappeared. (Compare the abstract on *Iodide of*

Sulphur, under "Inorganic Chemistry."—REP.)—Pharm. Jour. and Trans., Jan. 16, 1886, 609-610.

Pure Hydrobromic Acid—Preparation.—Professor J. S. Stas, requiring for certain determinations, hydrobromic acid absolutely free from iodine and chlorine, prepared it as follows: He first dissolved the bromine in bromide of potassium, added oxide of zinc to the solution, and distilled the mixture. Any chlorine that may have been present in the bromine will remain behind as chloride of potassium, any iodine present will combine with the oxide of zinc, and pure bromine will distill over. Hydrobromic acid is then prepared from this in the usual manner, by acting with the bromine upon red phosphorus in the presence of water.—Zeitsch. f. Anal. Chem., 1886, 213.

Bromate of Sodium—Preparation and Use for Making Volumetric Iodine Solution.—Dr. Kretschmer suggests the preparation of a volumetric solution of iodine in which the iodine is liberated as required, by the addition of a mineral acid, thus assuring absolute accuracy and no loss by volatilization. He points out that *bromate* of sodium, in presence of a sufficient amount of iodide of potassium, when treated with a mineral acid, liberates a quantity of iodine equivalent to the oxygen contained in its molecule. In fact, the mineral acid decomposes the bromate, setting free its bromine; this liberates its equivalent quantity of iodine, and takes its place, and the liberated iodine is then available for the volumetric determination.

Bromate of Sodium may be easily obtained pure, and in a crystalline condition, by adding an excess of bromine to hot solution of soda, evaporating and separating the first crop of crystals. This crop, consisting of strongly shining tetrahedrons, should be recrystallized from water, which will at the same time eliminate all traces of chlorine. When perfectly free from bromide, they may be rubbed to powder, and dried. They will stand a temperature up to 180°C . without decomposition. One gramme of bromate of sodium, according to the author's experiments, replaces 5.04 grammes of iodine. Or 1 gramme of iodine may be replaced by 0.1984 gramme of bromide of sodium. The volumetric solution of bromate of sodium, therefore, is prepared by dissolving 2.512 grammes (or, when bromine = 79.8 : 2.508 grammes) of bromate of sodium in water to 1 liter, and it is then exactly equivalent to the one-tenth normal volumetric solution of iodine containing 12.66 grammes of iodine in the liter.—Zeitschr. f. Anal. Chem., 1885, 546.

IODINE.

Iodine—Production in Peru.—According to the "Génie Civil," 1884, 5, 106, about 1,600 kilos of iodine are produced monthly at the works of Peruana, in the province of Tarapaca, in Peru, from the iodous mother-liquors obtained in the manufacture of sodium nitrate. The forms of

apparatus constructed by R. Harvey and J. T. North, in 1881, are employed for the preparation of the hydrogen sodium sulphite used to precipitate the iodine, and for distilling the latter. The hydrogen sodium sulphite is obtained by saturating a solution of soda with sulphurous anhydride. The soda is prepared by furnacing an intimate mixture of sodium nitrate and coal-dust. The essential constituent of the product of the reaction is soda contaminated with sodium chloride, sodium sulphate, earthy ingredients, and unburnt coal.—*Amer. Drugg.*, Aug. 1885, from *Dingl. Polyt. Jour.*

Iodine—Economical Production from Seaweeds, which see under “*Materia Medica.*”

Iodine—Estimation and Preparation from Bromine and Chlorine.—The following simple method is described by Mr. G. Weiss: To the solution of the halogens, which must be present in the form of simple and easily decomposable compounds; concentrated solution of ferric sulphate is added, and the whole boiled, whereby the iodine is liberated. A current of air is passed through the solution during the heating, and then into a solution of iodide of potassium, which absorbs the iodine carried over. When all the iodine has been thus carried over, the solution of iodide of potassium containing the iodine is removed for titration and replaced by dilute ammonia. The residue in the flask is allowed to cool, a slight excess of permanganate of potassium is added, and the flask is warmed to 50° or 60° C. Bromine is thus liberated, carried into the dilute ammoniac solution by the current of air, and may be estimated either gravimetrically or by titration. The chlorine may be estimated in the residue either directly, or better, by difference from a determination of the total quantity of I, Br and Cl, present in the original substance. If the halogens are present in the original substance as oxy-acids, they must be reduced by HS or other suitable means; if in the free state they are best converted into zinc compounds by treatment with zinc dust.—*Chem. Centralbl.*, 1885, 634 and 712.

Iodine—Volumetric Determination.—Mr. E. Fallieres recommends the following process for the volumetric estimation of iodide of potassium, or rather, of the iodine contained therein: 0.1 gm. of the salt is added to any desired quantity (say 30 to 50 gm.) of a 25% solution of ferric chloride, and the mixture distilled. Iodine will pass over and is to be caught in a receiver containing 5 gm. of chloroform and 51 cc. of a solution of hyposulphite of sodium of 0.3 per cent., or such a quantity that all the iodine liberated from the iodide of potassium may enter into combination according to the following reaction:



When the distillation is completed, the excess of hyposulphite is deter-

mined by titration with a solution of iodine, containing in 1 liter 7.64 gm. of iodine, and 10 gm. of iodide of potassium, so that 1 cc. of it corresponds to 10 milligrammes of pure iodide of potassium. The author suggests that this process may be used also inversely, for the determination of iron. In this case, it would only be necessary to use an excess of solution of iodide of potassium, and the amount of free iodide distilled over would give, by a simple calculation, the amount of ferric iron that had been present in the mixture.—*Amer. Drugg.*, Feb. 1886, 29.

Iodine—Examination of Commercial Samples.—Mary H. Spencer communicates the results of the examination of eleven specimens of iodine bearing the label of different American manufacturers. After giving the details of the examination, the author sums up the results in tabular form, as follows:

Appearance.	Odor.	Volatilization.	Solution in water.	Solution in ether and water.
1. Large crystals, slightly adhesive .	Normal.	Complete.	Yellowish brown.	Complete.
2. Large, clean crystals, slightly adhesive	Acetous.	"	"	"
3. Medium clean crystals, slightly adhesive	Normal.	"	"	"
4. Large, clean crystals, adhesive	"	"	"	"
5. Small crystals, adhesive in lumps	Ethereal.	"	"	"
6. Medium crystals, slightly adhesive .	Normal.	Slight residue.	"	"
7. Small, greasy crystals, adhesive in lumps	"	Complete.	"	"
8. Small crystals, adhesive	"	Slight residue.	"	"
9. Large crystals, adhesive	"	"	"	"
10. Large crystals, adhesive	Acetous.	Complete.	"	"
11. Medium, greasy, adhesive crystals .	"	"	"	"

Solution in chloroform.	Solution in acid sulphurous.	Chlorine and bromine.	Cyanide of iodine.	Calcium salts.	Estimation of iodine.	Estimation of water.
1. Complete.	Complete.	None.	None.	None.	98.454 %	1.53 %
2. "	"	"	"	"	97.600 %	2.38 %
3. "	"	"	"	Trace.	99.161 %	0.84 %
4. "	"	"	"	"	98.210 %	1.79 %
5. "	"	"	"	"	98.966 %	1.00 %
6. "	"	"	"	"	97.673 %	2.29 %
7. "	"	"	"	"	96.535 %	3.43 %
8. "	"	"	"	"	97.390 %	2.57 %
9. "	"	"	"	"	97.917 %	2.00 %
10. "	"	"	"	"	97.722 %	2.25 %
11. "	"	"	"	"	96.710 %	3.20 %

The results indicate that the iodines examined were quite up to the pharmaceutical standard.—*Amer. Drugg.*, Aug. 1885, 144; *Proc. Ohio State Pharm. Assoc.*, 1885.

Iodine—Solutions in Oils.—According to Mr. G. Grenel, the 20 per cent. solution in castor oil is of a brown color and thick; in olive oil and almond oil, of a brownish red color and somewhat thinner. For practical purposes the solution in castor oil is of special interest as being miscible with strong alcohol, and mitigating some inconveniences resulting from the use of tincture of iodine. The author recommends the following formula: Dissolve with a gentle heat iodine 10, in castor oil and alcohol (93 per cent.) each 45.—Archiv d. Phar., June 1885; Amer. Jour. Pharm., Sep. 1885, 435.

Iodide of Sulphur—Character of Combination of its Elementary Constituents.—Mr. J. G. Tingle contributes a lengthy paper in which he reviews the different processes for the preparation of iodide of sulphur that have been given at different times in the Pharmacopœias and other standards of authority, as well as the views that are held as to its constitution. He also records his own experiments with the compound, and is forced to the conclusion that iodide of sulphur, in whatever manner prepared, is not one in which chemical union has taken place, and that the view held by Sestini, that iodide of sulphur is a body analogous in constitution to the metallic alloys, is probably the correct one. The assumption of this analogy alone satisfactorily explains the weak and scarcely noticeable union between the two substances; a union weaker than that which exists between a substance and a solvent.—Pharm. Jour. and Trans., Jan. 9, 1886, 583–585.

Iodide of Potassium—Decomposition in Water.—According to Mr. J. Mülhe, iodide of potassium dissolves in water without partial decomposition, only when the water is free from carbonic acid. In testing iodide of potassium, therefore, it is advisable always to use well-boiled water and a perfectly neutral solution of starch.—Pharm. Centralh., 1886, 55.

Iodide of Potassium and Starch—Unchangeable Solution.—Mr. Alexander Müller has shown that ordinary starch solution may be kept for years by treating it with caustic potassa. Mr. C. Reinhardt has utilized this method for preparing a permanent solution of starch and iodide of potassium as follows: Weigh 5 gm. of finely powdered wheat starch, put it into a flask holding 1 liter, add about 50 cc. of water, shake well, wash the adhering starch down into the bottom of the flask by means of the wash-bottle, and add 25 cc. of solution of caustic potassa (prepared from 1 part of caustic potash purified by alcohol, and 2 parts of water). Shake well. To the homogeneous, gelatinous mass thus produced add 500 cc. of water, also 2 gm. of iodide of potassium, and heat the flask on a plate of asbestos to boiling—repeatedly shaking—until a clear solution results. Let it cool, pour the contents into a graduated cylinder, fill it up with water to 1,000 cc. and filter. This solution will keep any length of time, and need not be put in a dark place.—Zeitsch. f. Anal. Chem., 1886, 37.

FLUORINE.

Hydrofluoric Acid—Preparation in Iron Retorts.—Mr. Walter Hempel has found that iron retorts may be employed in the preparation of hydrofluoric acid, provided only concentrated sulphuric acid is used to decompose the fluorspar. An iron retort is connected with an iron pipe, about $1\frac{1}{8}$ inches in diameter, which is connected by means of a flange with a lead pipe leading to the condenser. The latter is a lead cylinder, about 6 inches wide and 28 inches high, having an exit tube at the bottom, and provided with a cooling worm. It is filled with coarse pieces of wood charcoal. The retort having been charged with 1 kilo each of fluorspar and concentrated sulphuric acid, heat is applied, best over a naked fire. The vapor passing over rises through the pieces of charcoal, but is there encountered by water dripping downwards from a lead capsule placed on the condenser, into the bottom of which some fine holes had been punched, and which had been charged with about 750 cc. (26 fl. oz.) of distilled water. When no more liquid drips from the condenser, the contents of the leaden receiver are poured back into the capsule on top of the condenser, and the distillation continued until the retort is at a low red heat. On opening it, its contents of dry plaster of Paris may easily be removed with an iron chisel. The most simple method of purifying the hydrofluoric acid thus produced, according to Hempel, is the following:

Divide the product into two equal portions, slightly supersaturate one portion with ammonia, then mix it with the second portion, and evaporate in a platinum capsule. When properly concentrated, crystals of the acid fluoride of ammonium (hydrogen ammonium fluoride) crystallize out, which (after being separated from the liquid by a glass funnel, covered with wax, or an india-rubber funnel) may be recrystallized, and thus obtained perfectly pure. This salt may be preserved in a wooden or paper box, without alteration, and may be used for most purposes for which hydrofluoric acid is required.—*Amer. Drugg.*, Oct. 1885, 185, from *Ber. d. Deutsch. Chem. Ges.*, 1885, 1438.

Fluoride of Ammonium—Medicinal Uses.—Dr. J. Lucas, of Bombay, has introduced the use of fluoride of ammonium in the treatment of hypertrophy of the spleen, and says that it possesses the merit of excelling any other remedy for this purpose with which he is acquainted. The dose of the solution (strength not stated) is 5 minims, well diluted and taken after meals to prevent nausea and purging.—*Phar. Jour. and Trans.*, May 29, 1886, 1006; *Lancet*, May 22, 1886, 991.

PHOSPHORUS.

Phosphorus.—Luminosity destroyed by the vapor of *Balsam of Tolu*, which see under "Materia Medica."

Hypophosphoric Acid—Preparation and Characters—Mr. A. Joly de-

scribes the preparation and characters of hypophosphoric acid and some of its salts. Phosphorus partly immersed in water is allowed to oxidize slowly in a confined space of air at the ordinary temperature, the acid liquid heated to boiling, mixed with carbonate of sodium until neutral to methyl-orange, concentrated and allowed to cool. The salt which separates is washed with cold water and recrystallized from boiling water, when it forms large crystals identical with those of

Hypophosphate of Sodium ($\text{Na}_2\text{H}_2\text{P}_2\text{O}_6 + 6\text{H}_2\text{O}$) described by Salzer. It loses $6\text{H}_2\text{O}$ at 110° , and at a red heat is converted into metaphosphate of sodium with evolution of hydrogen. Its solution gives a white precipitate with nitrate of silver, which dissolves in warm dilute acid, from which $\text{Ag}_4\text{P}_2\text{O}_6$ crystallizes on cooling.

Hypophosphoric acid resembles phosphoric and phosphorous acids in its behavior towards methyl-orange and phenolphthalein, but differs from them in that it shows an intermediate state of saturation corresponding with the formation of a sesqui-salt. The acid is best prepared from the monobasic salt by decomposing with an equivalent of sulphuric acid, allowing to stand 2 or 3 days, decanting the clear acid, and evaporating in vacuo over some hygroscopic substance. It is thus obtainable in bulky rectangular tables, probably belonging to the rhombic system. These crystals have the composition $\text{P}_2\text{O}_4, 4\text{H}_2\text{O}$, are quite deliquescent, and dissolve rapidly in a small quantity of water. The author also describes and gives the method for preparing *Monobarium hyposulphate*.—Amer. Chem. Soc., March 1886; Compt. Rend. ci., 1058–1061 and 1148–1151.

Phosphoric Acid—Objection to Official Process.—According to Mr. R. Rother, an objection to the official process is that the nitric acid in excess cannot be thoroughly removed, and hence microbic growths invariably appear in the diluted acid. The author has found that diluted phosphoric acid containing a trace of chlorhydric acid furnishes no sustenance to these organisms, in fact becomes inimical to their propagation. It is the opinion of the author that the addition of a little chlorhydric acid to the concentrated residue of the nitric acid process, in conjunction with heat, will destroy the persistent vestiges of nitric acid. In this reaction the nitric and chlorhydric acids mutually destroy each other and are dissipated as lower oxides of nitrogen and free chlorine. Incidentally any traces of arsenic are simultaneously expelled as volatile arsenious chloride. The slight excess of chlorhydric acid eventually serves to prevent the apparition of bacterial protophytes in the diluted acid. The author believes that the 10 per cent. basis for all the diluted acids is of no material advantage, and cannot be consistently applied to all the diluted acids. The diluted phosphoric acid should be increased about 25 per cent. and thus brought to the proportion of one troy ounce in 8 fluidounces. Accordingly one pint of the diluted acid would then

contain four troy ounces of the 50 per cent. phosphoric acid.—*Drugg. Circ.*, April 1886, 99-100.

Phosphoric Acid—Review of the Different Processes.—Mr. Adolph Sommer reviews and classifies the different processes that have been proposed and are in use for the preparation of phosphoric acid. The author advocates and describes the process first described by Professor Wenzell (see *Proceedings*, 1882, 556), which depends upon the circumstance that phosphorus is slowly oxidized by moist, cool air. He has modified the process as follows: In a shallow vessel made of glass, porcelain, or earthenware, are placed longitudinally and resting on two cross pieces, strips of heavy plate glass of about $\frac{3}{4}$ inch in width. A space of about $\frac{1}{8}$ inch is left between the pieces. A porous cover (a slab of plaster of Paris, recommended by Prof. Wenzell) is provided to exactly fit and tightly cover the vessel. When all is in readiness, distilled water is poured in until it stands about $\frac{3}{4}$ inch over the glass diaphragm. Then the sticks of phosphorus are laid exactly over the slits that have been left in the diaphragm, the excess of water drawn off by means of a siphon or a syringe, until about $\frac{1}{8}$ inch of the sticks of phosphorus is above the surface of the water, and the apparatus is quickly covered by the porous slab. In from two to four days the phosphorus will be found to have been eaten away to exactly the level of the liquid, which is now highly acid. In order to continue the oxidation a portion of the liquid is drawn off, and thus a fresh portion of phosphorus exposed; but care must be taken not to draw off too much or too little. In the former event the oxidation takes place too rapidly, and the phosphorus is liable to melt and run into the lower part of the apparatus; in the latter event the oxidation is unnecessarily prolonged. The further directions relate to the removal of arsenic, and the oxidation of the phosphorous acid into phosphoric acid by nitric acid and bromine. These may be consulted in the author's paper as communicated to *Western Drugg.*, Jan. 1886, 1-9.

Phosphoric Acid—Determination.—Dr. Fassbender has carefully compared Julius Laubenheimer's process, depending upon the use of the citrate of the alkalies, with the molybdenum process, and finds it to yield perfectly satisfactory results, so that the molybdenum method may be abandoned. The process is as follows:

From 25 to 50 cc. of the liquid containing the phosphates—in quantity corresponding to 0.1 to 0.2 gm. of phosphoric anhydride, P_2O_5 —is mixed with 10 cc. of solution of citric acid (500 gm. in 1 liter), and afterwards with a large excess of concentrated ammonia. When the mixture has somewhat cooled, 15 to 20 cc. of the ordinary magnesium mixture (see *U. S. Ph.*, p. 392, but preferably containing chloride instead of sulphate of magnesium) is added, whereupon the precipitate of phosphate of magnesium and ammonium will separate in a crystalline condition. The precipitation is hastened by stirring with a glass rod during one or two

minutes. It is best to delay filtering until the following day to insure complete precipitation. The latter may be shown to be complete by taking a little of the filtrate in a test-tube, acidulating with nitric acid, adding molybdate of ammonium, and warming, which must not produce any turbidity. The small quantity of precipitate which settles upon the walls of the beaker and the stirring rod may be detached by rubbing with a rod covered at the end with a small piece of rubber-tubing. The precipitate is first washed with water of ammonia, afterwards with alcohol, and may then be at once ignited in platinum. When very much iron and alumina are present, the quantity of solution of citric acid must be increased, and is then best doubled (20 cc.), a correspondingly larger quantity of ammonia being afterwards employed. But after the magnesium solution has been added, the mixture must be stirred for several minutes at least, until the liquid portion appears cloudy. If this is done, the precipitation of the phosphoric acid will be completed within an hour (even in presence of very much iron), and filtration may be proceeded with at once.—*Amer. Drugg.*, April 1886, 68, from *Chem. Zeit.*, 1885, No. 103.

BORON.

Boracic Acid—Method of Pulverization.—It is stated in “*L’Union Pharm.*” (xxvii, 53) that the pulverization of boracic acid is readily accomplished by agitating a hot saturated solution with an egg beater until cold. When the solution is cold small microscopic crystals will be found at the bottom of the vessel; these are pressed between folds of filtering paper, and while yet damp triturated in a mortar.—*Amer. Jour. Pharm.*, April 1886, 167.

Boric Acid—Symptoms of Poisoning.—According to Molodenkow the symptoms of poisoning by boric acid are continual vomiting and hic-cough, the appearance of red spots in the face, and diminution of the number of heart-beats. In one case death followed in four days. Stimulants and morphine are recommended as antidotes.—*Amer. Jour. Pharm.*, Sept. 1885, 435; from *Jour. de Pharm. Chim.*

Boric Acid—Value in Diabetes Mellitus.—Mr. F. A. Monckton reports that he has cured one case of diabetes mellitus with this drug. The patient was not stringently dieted, but was given seven grains of the acid three times a day, and at the end of ten weeks the sugar had all disappeared from the urine, the specific gravity being reduced from 1025 to 1016. The drug produces no unpleasant effect.—*Cin. Lancet*, March 6, 1886; from *Australasian Med. Gaz.*

Boric Acid—Value in Epidemic Cholera.—Boric acid is recommended by Artimini in epidemics of cholera, etc., as an antiseptic and for destroying micro-organisms, and as being not injurious if taken in small doses, which may be added to food or drink.—*L’Orosi*, 8, p. 44; *Archiv. Pharm.*, 1885; *Amer. Jour. Pharm.*, Sept. 1885, 435.

Boric Acid—Use as a Corrective to Offensive Urine.—An English physician says he has met no case of offensive urine (intestinal vesical fistula excepted) that ten or twenty grains of boric acid, given every three hours, would not cure.—*Amer. Jour. Pharm.*, May 1886, 238; from *Canadian Practitioner*.

Borax—Dissociation in Presence of Glycerin, Bicarbonate of Sodium, and Water.—Mr. Frank A. Bauer, in answer to a query "why effervescence occurs when powdered borax, bi carbonate of soda, glycerin and water are mixed," replies that the action is doubtless due to the separation of the ordinary biborate into a monobasic borate, and liberation of boric acid, which acting upon the bi-carbonate, liberates carbonic acid. The supposition that the reaction is due to impurities—notably in the glycerin—is incorrect.—*Pharm. Rec.*, June 15, 1886, 182; from *Proc. Ohio State Pharm. Assoc.*, 1886.

Borax—Effect as a Precipitant for Morphine, which see under "Organic Chemistry."

Borate of Manganese—Preparation from Residues of the Generation of Chlorine.—Mr. E. Dieterich states that the residue left after the preparation of chlorine gas may be utilized as follows: Dilute the residue with 10 parts of water, then add a dilute solution of carbonate of sodium, under stirring, until a small quantity of a pale reddish precipitate is produced. This precipitate will redissolve on further stirring, while ferric oxide and alumina will separate in place of it, in brown flakes. If the first formed precipitate has redissolved, and the liquid has not become light colored, more soda solution must be added. The separation of iron and alumina may be judged to be complete when a little of the manganese carbonate remains undissolved. Now filter the solution and add a dilute solution of borax as long as a precipitate is produced. Collect this, without washing, on a strainer, and dry it. This borate of manganese, when pure and unadulterated, is in large demand by manufacturers of varnishes and patent driers.—*Amer. Drugg.*, May 1886, 89; from *Phar. Centralh.*

SILICON.

Silica.—Deposition in crystalline form in a stock bottle containing *Sulphurous Acid*, which see under "Sulphur."

Silica—Occurrence as a Urinary Sediment.—Abonnel has observed silica in a urinary sediment. The sediment was granular, the surface smooth, the angles rounded, and was hard enough to scratch porcelain; it consisted chiefly of silica, with small quantities of calcium oxalate and uric acid.—*Amer. Jour. Phar.*, Feb. 1886, 105; from *Lyon Méd.*, June 21, 1885.

Asbestos—Uses.—Dr. Frederick Hoffmann draws attention to the different uses to which asbestos has recently been applied. In connection

with pharmacy it is of interest that a very excellent quality of asbestos filter sheets is now being made in New York. For this purpose the so-called *wood-asbestos*, which is found principally in Canada, but also in North Carolina and on Staten Island, is used; this kind being composed of very long fibres.—Pharm. Rundschau, Nov. 1885, 252. 253.

CARBON.

Carbonic Oxide—Preparation.—Mr. Schwarz describes a method for the preparation of pure carbonic oxide which is similar to that described by him for the preparation of *pure hydrogen*, which see.

Carbon Disulphide—Efficiency in Certain Forms of Neuralgia.—Dr. Gasparini records 16 cases of neuralgia treated with this remedy, applied locally. Neuralgias from mechanical causes, from malarial infection, and from poisoning by metals, are not under consideration. The cases treated were such as pure facial neuralgia, pleurodynia and sciatica. The method of treatment is as follows: A small piece of cotton wool on which 10–12 drops of the disulphide have been poured is at once applied to the painful spot, and covered with another piece of cotton wool, which may be held there till the neuralgia is relieved. The pain produced by the application is intense, and the relief obtained is doubtless from the nerve affected being stunned. In some of the cases a permanent cure resulted; in all there was amelioration of the pain.—Med. Chrop., Dec., 1885, p. 227; from Gazz. Med. Ital. Lomb.

CYANOGEN COMPOUNDS.

Hydrocyanic Acid—Influence upon the Germinating Power of Seeds, etc.—Prof. Schaer reports the results of an investigation as to the influence of hydrocyanic acid upon the germinating power of seeds. In comparing the behavior of seeds of *Lolium perenne*, *Trifolium pratense*, and *Brassica Rapa*, under normal conditions, and when placed in contact with solutions containing one-half, one and two parts of hydrocyanic acid per 1000, it was found that the smallest quantity of the acid was sufficient to stop germination completely, whilst under normal conditions from 83 to 95 per cent. of the seeds germinated in five days. The seeds that had been in contact with the acid, after being freed as completely as possible from it, germinated to the extent of 54 to 89 per cent., this lower percentage of germination being attributed to the influence of small quantities of hydrocyanic acid still adherent to the seeds, or to injury received during the cleansing manipulations.

A similar inhibiting influence was observed to be exercised by hydrocyanic acid upon the action of ferments representing both the organized and unorganized types, the ferments regaining their activity when the acid was removed; these latter results are confirmatory of previous results published by Prof. Sonnenschein.—Pharm. Jour. and Trans., Oct. 31, 1885, 369; Chem. Ztg., Oct. 4, 1885, 1429.

Cyanides—Detection in Presence of Other Salts.—Mr. W. J. Taylor distils with sodium bicarbonate instead of tartaric acid. In thus distilling a 10 per cent. solution of ferrocyanide of potassium no trace of hydrocyanic acid was found, while in a distillate from a $\frac{1}{100}$ per cent. solution of potassium cyanide, treated with ammonium sulphide to form sulphocyanate of ammonium, hydrocyanic acid could readily be detected. To cyanide of mercury a piece of metallic zinc must be added. The presence of sulphate of potassium, ferrocyanide or ferridcyanide of potassium, and of ammonium salts, does not affect the reaction.—*Amer. Jour. Pharm.*, Nov. 1885, 551.

Cyanide of Mercury—Value in Syphilis.—Dr. Prochorow reports eighty cases of syphilis treated with subcutaneous injections of a one per-cent. solution of the cyanide. The average number of injections required before the disappearance of active symptoms was twenty. Not more than twenty-five or thirty drops were injected at a time. Only two abscesses resulted from nearly twenty-seven hundred insertions.—*Amer. Jour. Pharm.*, Sept. 1885, 459; from *N. Y. Med. Jour.*, June 13, 1885.

Cyanide of Gold and Potassium—Medicinal Application.—Dr. Galewski employs this compound in the form of hypodermic injection, in cases of ataxic papillary atrophy. The dose is 5 milligrams (about $\frac{1}{12}$ grain) at first, and afterwards 10 milligrams (about $\frac{1}{6}$ grain) every day or every two days. The solution should be freshly prepared, and with great care, a good proportion being:

	Gm.	
Cyanide of Gold and Potassium	0.10	1.6 gr.
Distilled Water	10.00	160 min.

8 minims = 5 milligrams.—*Amer. Drugg.*, Aug. 1885, 150; from *Journ. de Pharm. et Chim.*

Ferridcyanide of Potassium—Effect of Light on its Solution.—Dr. Eder finds that when ferridcyanide of potassium in aqueous solution is exposed to the light, it is decomposed with formation of ferrocyanide of iron and potassium, or free hydrocyanic acid. A 1 per cent. solution undergoes change more rapidly than an 8 per cent. solution. The decomposition is hastened by the addition of oxalates, citrates, acetates, or sugar.—*Pharm. Jour. and Trans.*, Oct. 3, 1885, 285; from *Monatshefte*, vi., 495.

Nitroprussic Acid—Compound with the Opium Bases, which see under "Organic Chemistry."

POTASSIUM.

Potassium Hydrate—Presence of Nitrite of Potassium in the Commercial Article.—Prof. Wyndham Dunstan, having observed an unusual reaction with a solution of potash, traced this to the presence of nitrite of

potassium in the hydrate of potassium from which it was made. He was thus led to extend his inquiry to other specimens, and found five of these to contain respectively 1.0, 0.74, 0.56, 0.47 and 0.34 per cent. of KNO_2 . The specimens also contained nitrate, and about 4.5 per cent. of chloride, silica and alumina. They contained on an average 78-79 per cent. of total alkali. The best method for the detection of the nitrite consists in adding a little solution of iodide of potassium to about an ounce of diluted sulphuric acid, preferably contained in a flask. To this about half a stick (5 grams) of potash is added, and the flask rapidly rotated, when iodine will be liberated, and color the liquid from a yellow to a reddish brown, according to the quantity of nitrite present.—Pharm. Jour. and Trans., March 13, 1886, 778.

Caustic Potassa—Determination of Carbonate.—Mr. A. Koster finds that lime water, or bitter solution of sulphate of calcium (gypsum), serves an excellent purpose for determining the presence of carbonate in caustic potassa solution. If the solution of potassa of the Ph. Germ., diluted with 4 times its weight of water and boiled and filtered, is added to a mixture of 10 cc. of saturated solution of sulphate of calcium and 5 cc. distilled water, no turbidity is produced in the absence of carbonate of potassium, but a decided turbidity is produced if the potassa solution contains $\frac{1}{2}$ of 1% of carbonate. In a mixture of 5 cc. of gypsum solution and 15 cc. water, a solution of potassa, diluted and treated as above, will not produce a turbidity unless it contains 1.5% or more of carbonate.—Arch. d. Pharm., Aug. (1) 1885, 576-579.

Potassium Salts—Action of Ammonium.—According to the experiments of Mr. H. Giraud, most potassium salts are less soluble in water charged with ammonia than in pure water. Some, such as the sulphates, oxalates, ferrocyanides, and phosphates, are partially precipitated if to their saturated solutions there is added a saturated solution of ammonia. Others, such as the chloride, nitrate, and chlorate, are not precipitated if their saturated solutions are saturated with ammonia. If a very strong solution of potassium carbonate is saturated with ammonia, there are formed two strata; the upper layer contains the bulk of the ammonia, whilst the lower contains nearly all the potassium carbonate. Of all the potassium salts the least soluble is the sulphate. Potassium solutions so dilute as not to be precipitated by acid sodium tartrate, nor by platinum tetrachloride (without the addition of alcohol), give an abundant precipitate if they are first saturated with gaseous ammonia, and then mixed with an ammoniacal solution of sodium sulphate.—Amer. Drugg., Sept. 1885, 172; from Compt. Rend., 1885.

Nitrate of Potassium—Commercial Quality.—Eleven specimens of commercial nitrate of potassium were examined under the supervision of Prof. Robt. B. Warder in the laboratory of Purdue University. The

examination shows that when genuine saltpetre (nitrate of potassium) is offered for sale, it is practically free from all impurities, except traces of chloride, as indicated by numbers 1 to 8. These eight samples conformed very closely to the requirements of the Pharmacopœia; but two of them had a tinge of color, and four had excess of chloride. Number 9 is essentially nitrate of sodium (sometimes called Chili saltpetre); number 11 is chloride of sodium in angular transparent lumps (or "rock salt"); and number 10 is a mixture of both.

REACTIONS OBSERVED.

Reaction with Nitrate
of Silver.*Genuine.*

- No. 1, Opalescence.
- No. 2, Precipitate.
- No. 3, Slight Prec.
- No. 4, Slight Opal.
- No. 5, None.
- No. 6, Slight Opal.
- No. 7, Slight Opal.
- No. 8, Slight Prec.

These samples were all white powders or colorless translucent lumps, except a yellow tinge in No. 5 and No. 6; solutions of all were neutral to litmus, gave distinct VIOLET color to flame, and remained clear on the addition of sulphide of ammonium, carbonate of ammonium, oxalate of ammonium, and chloride of barium. No. 8 was a selected crystal.

False.

- No. 9, Opalescence.
- No. 10, Heavy Prec.
- No. 11, Heavy Prec.

Solutions of these samples were neutral with litmus, gave bright YELLOW color to the flame, and remained clear on the addition of sulphide and carbonate of ammonium; but chloride of barium and oxalate of calcium showed traces of sulphate of calcium in No. 11, and still more in No. 10.

From the above and other experiments, Prof. Warden concludes that the goods offered as pure saltpetre contain no impurities which are likely to be hurtful, but druggists should be careful to purchase from reliable houses, and never to dispense as saltpetre that which will impart a yellow color to an alcohol flame. Those who have occasion to use "commercial saltpetre" should note whether it is nitrate or chloride of sodium, or a mixture of both. Fortunately, these are very readily distinguished by the taste, if only one is present, and the separate lumps may sometimes be distinguished in the mixture. If each article could be sold under its true name, much confusion might be avoided.—*Amer. Jour. Pharm.*, June 1886, 286-289.

Nitrate of Potassium.—Occurrence in the stalks of *Rhubarb*, which see under "Materia Medica."

Nitre—Presence of Chlorates.—Mr. H. Beckurts finds that nearly all the commercial saltpetres contain small quantities of chlorates and perchlorates. Seven samples, representing soda and potassa saltpetres from prominent manufacturers, were examined and uniformly contained small percentages. The presence of chlorates in nitre has hitherto escaped notice.—*Arch. d. Pharm.*, April (2) 1886, 333-337.

Nitrate of Potash—Fatal Case of Poisoning.—Dr. Littlejohn draws attention to a case in which nitre had evidently been given to a boy of three with the intention of poisoning. The child when first seen, probably 25 minutes after the administration of the poison, was cold, sick and vomiting. Afterwards the child vomited repeatedly and was violently purged, and, without medical assistance having been called, died in two hours.—See *Pharm. Jour. and Trans.*, Nov. 21, 1885, 428.

SODIUM.

Alkalimetry—A New Indicator.—Messrs. Theodore Lehmann and Julius Petrie have published the results of some studies and observations made with a coloring matter originally obtained by Liebermann from phenol. This is produced by the action of concentrated sulphuric acid, in the presence of a nitrite, upon phenol, and appears in form of red brown, amorphous flakes, soluble with yellow color in various neutral solvents, and in concentrated sulphuric acid with dark bluish-green color. A spectroscopic examination led the authors to suspect that this coloring matter was not a single chemical individual, but contained a second coloring substance which appeared to have great resemblance to litmus. It is reddened by acids and rendered blue by alkalies, the transition being extremely sharp and sudden, and taking place even in the most dilute solutions. This coloring matter is prepared in the following manner:

Mix 5 cc. of phenol with 5 cc. of concentrated sulphuric acid, keeping the mixture cool, and then add, in drops, 20 cc. of nitro-syl-sulphuric acid (prepared by dissolving 5 parts of nitrite of potassium in 100 parts of cold concentrated sulphuric acid). When all is added, heat the mixture on a water bath to 80° C. (176° F.) until the mass has a dark violet-blue color, and until a sample, taken out and mixed with enough concentrated sulphuric acid to form a transparent mixture, ceases to possess the characteristic spectrum of Liebermann's coloring matter (see below), but shows a clear absorption-band from B $\frac{1}{2}$ C to D $\frac{1}{3}$ E, the color being pure blue in proper dilution. When this point has been reached, the mixture is poured into about 2 liters of cold water, when the coloring matter will separate in form of a dark-violet, amorphous substance. This is collected on a filter, washed until all traces of sulphuric acid have disappeared, and dried at 100° C. (212° F.). The dry residue is dissolved in ether, and the filtered solution deprived of ether by distillation, when the pure coloring matter will remain behind. Thus prepared, it is easily soluble in acetone, ether, ethylic, methylic, and amylic alcohol with yellow color; less easily soluble in chloroform, difficultly so in benzol and toluol, insoluble in petroleum ether and ligroin. Concentrated sulphuric acid dissolves it with a pure blue color. On diluting this solution with a little water, or on dissolving the coloring matter in fuming hydrochloric acid, a yellowish-red liquid results.

The new indicator shares with phenolphthalein the property that it is not indifferent towards carbonic acid, and is unreliable in presence of ammonia. It is, however, far more delicate even than phenolphthalein. As an instance, the authors quote this fact: 50 cc. of water deprived of carbonic acid were mixed with a few drops of alcoholic phenolphthalein solution, and then titrated with $\frac{1}{100}$ normal soda solution. It required 0.5 cc. to produce a permanent reddening. On repeating the experiment with the new indicator, only *two drops* of the soda solution were required to produce a blue color.—Arch. d. Phar., 1885, 243; Amer. Drugg. Aug. 1885, 151.

Soda—History.—Prof. F. A. Flückiger communicates an admirable resumé of the historical facts connected with the manufacture of soda, which will be consulted with interest in Arch. d. Pharm., Nov. (2) 1885, 865-873.

Caustic Soda—Commercial Quality.—Mr. D. B. Dott has examined five samples of caustic soda B. P., and five samples of "caustic soda, pure, by alcohol." The former, with one exception, was up to the pharmacopœial strength, the percentage of sodium hydroside varying from 86.5 to 98. In the pure samples the percentage varied from 71 to 87, the lumps giving the best results, the sticks being inferior. All of these contained traces of chloride and sulphate, and one of them was contaminated with lead. The B. P. lots contained large quantities of chloride and sulphate. It is noteworthy that the samples of "pure" are more than 10 per cent. weaker in real soda than the B. P. samples.—Yearbook of Pharmacy, 1885, 416, 417.

Soda—Action of its Solution on Glass Flasks.—Mr. A. Müller observes that titrated normal soda solution when preserved in glass bottles kept well closed with caoutchouc, changes its titre but very slightly even when kept for a number of years. In a case coming under the author's observation the deposit was found to be composed of carbonate of lime, silicate with lime, soda and traces of iron, but neither potassa nor magnesia. Concentrated solutions, moreover, do not affect the glass as strongly as do the more dilute solutions of soda.—Arch. d. Pharm., Dec. (2) 1885, 977.

AMMONIUM.

Ammonia Water—Commercial Quality.—Mr. Geo. Gundrum has determined the strength of 23 commercial samples of ammonia water, sold as 3 and 4 F. respectively. One sample contained less than 5%, one between 6 and 7%, two between 7 and 8%, seven between 8 and 9%, one between 9 and 10%, four between 10 and 11%, and the remainder ranged between 11.1 and 13.6%. Two samples of stronger water of ammonia contained 20.2 and 20.75% of ammonia respectively.—Proc. Mich. State Pharm. Assoc., 1885, 122, 123.

Ammonium Carbonate—Examination of Commercial Samples.—Mr. Emil Schaible has examined four samples of carbonate of ammonium as follows: The solution made with dilute nitric acid was tested with barium chloride for sulphate. The solution in acetic acid was tested with silver nitrate; a precipitate insoluble in nitric acid indicated chloride, while one soluble in nitric acid and turning dark on standing was regarded as indicating hyposulphite. The same solution tested with ammonium oxalate showed the absence of calcium salt, and the solution in dilute hydrochloric acid, saturated with sulphuretted hydrogen, showed the absence of heavy metals, while on the subsequent addition of ammonia and ammonium sulphide, No. 4 only yielded a precipitate of iron. Empyreumatic substances were tested for by sulphuric acid and potassium permanganate. The results were as follows:

	Insoluble in alcohol.	Sulphate.	Chloride.	Hypo-sulphite.	Empyreumatic substances.	Carbonate, volumetric estimation.
No. 1 . . . 3	per cent.	1.7 per cent.	—	Trace.	Trace.	91.9 per cent.
No. 2 . . . 2.7	"	1.0 "	1 per cent.	—	—	92.2 "
No. 3 . . . 2.3	"	1.5 "	—	—	Trace.	91.6 "
No. 4 . . . 2.0	"	0.9 "	—	Trace.	Trace.	93.7 "

—Amer. Jour. Pharm., Jan. 1886, 11; from the author's thesis.

Carbonate of Ammonium—Commercial Character.—Mr. K. Kraut draws attention to a kind of carbonate of ammonium, now to be met with in commerce, which is distinguished from the old variety in that it does not lose its ammonia and delapse as rapidly, but retains its clear, hard, granular, crystalline form. The delapsing of the old variety, the sesqui-carbonate, is, as is well-known, due to its conversion into the acid or bicarbonate. The new variety is carbonate already so converted, or prepared, and corresponds in its composition to the so-called bicarbonate of ammonium.—Arch. d. Pharm., Jan. (1) 1885, 21-22.

LITHIUM.

Carbonate of Lithium—Solubility in Carbonic Acid Water.—Mr. A. Goldammer finds that when 75 grams of finely powdered carbonate of lithium are suspended in a litre of water, and a current of carbonic acid passed through the mixture for three days, 5.41 per cent. of the carbonate of lithium go into solution. Under pressure a large percentage could be dissolved (6.40 to 6.87 per cent.), but the solution deposited carbonate of lithium upon removing the pressure, whereas that obtained without pressure remained unaltered for several days. The solubility of the carbonate is apparently due to the formation of

Bicarbonate of Lithium, a compound which can exist only in solution, but even in this form is unstable. The commercial, dry, so-called bicarbonate of lithium is simply crystallized mono-carbonate, obtained

by evaporating the solution of bicarbonate on the water-bath.—Pharm. Centralh., April 1, 1886.

BARIUM.

Barium Hydrate—Use as a Saponifying Agent in the Examination of Butter, which see under "Organic Chemistry."

Barium Sulphate—Solubility in Hydrobromic Acid, etc.—Mr. Haslam observes that during an operation for the preparation of hydrobromic acid by the officinal (B. P.—Rep.) process, an attempt was made to remove the sulphuric acid contained in the crude liquor by means of carbonate of barium, before distilling off the acid; but upon filtering the liquor it was found that the filtrate still contained traces of sulphate of barium. Experiments made determined the quantity so dissolved to correspond to 1 part in 2500 parts of the solution. An experiment made with hydriodic acid showed sulphate of barium to be much less soluble in it than in hydrobromic acid, the amount dissolved being 1 in 6300 parts.—Chem. News, Feb. 19, 1886, 87.

CALCIUM.

Lime—Solubility in Water.—The following observations in reference to the solubility of lime and lime water are made in "Pharm. Centralh." (xxvi. 442): Ordinary quicklime contains caustic alkali which necessitates the throwing away of the first portion in making lime water. The solubility of calcium hydrate is influenced by the length of time it remains in contact with the water; for instance, 100 cubic centimeters of lime water, made from calcined marble in two minutes, required for saturation 9.80 cc. normal hydrochloric acid—equivalent to 1.372 grams Ca_2OH in 1 liter, showing the solubility to be 1:728; the same quantity of lime water which had remained in contact with the lime six hours required 9.30 cc. normal hydrochloric acid—equivalent to 1.302 grams of $\text{Ca}(\text{OH})_2$ in 1 liter, showing the solubility to be 1:768; 100 cc. lime water which had been in contact three days required 8.92 cc. normal hydrochloric acid for saturation—equivalent to 1.249 grams CaO in 1 liter, showing the solubility to be 1:800. Temperature is known to affect the solubility very much, boiling water dissolving but half as much $\text{Ca}(\text{OH})_2$ as water at the freezing point. The quantity of water used to slake the lime also affects the solubility. 100 parts of CaO require 32 parts of water to form $\text{Ca}(\text{OH})_2$; if 100 parts of lime are slaked with 50 parts of water, the lime takes up just enough water to form the hydrate; excess of water is lost by evaporation. Calcium hydrate thus formed is the most soluble, and when shaken with water quickly precipitates, yielding a perfectly clear filtrate when thrown on a dry filter. By dissolving the lime, the author noticed that oxide of calcium forms supersaturated solutions; 1 liter, at a temperature near 0°C ., contained 2.4 grams CaO ; at 12°C ., 1.8 grams CaO .—Amer. Jour. Pharm., Jan. 19, 1886.

Lime—Precipitation as Oxalate in Presence of Magnesia.—Mr. A. Müller observes that oxalate of ammonium when precipitated from ammoniacal solution in presence of magnesia, is obtained completely free from the latter base without the addition of chloride of ammonium, if the solution has been considerably diluted and the oxalate of ammonium is added gradually and in slight excess only. Arch. d. Pharm., Dec. (2) 1885, 976.

Milk of Lime—Estimation of Strength by its Density.—According to Mr. G. Lunge, the proportion of caustic lime in any given sample of milk of lime—in which all coarse particles have been allowed to settle—may be pretty closely determined with a hydrometer. The following table is given by Lunge:

Degrees Baumé.	Spec. Grav.	In 1 liter.	Caustic Lime (CaO.) in 100 parts.
1	1.007	7.5 Gm.	0.745 parts.
5	1.037	46 “	4.43 “
10	1.075	94 “	8.74 “
15	1.116	148 “	13.26 “
20	1.162	206 “	17.72 “
25	1.210	268 “	22.15 “
30	1.263	339 “	26.84 “

—Amer. Drug., Aug. 1885, 148; from Dingl. Polyt. Jour.

Chloride of Calcium—Value as an Alterative.—Dr. R. W. Creighton recommends chloride of calcium as a valuable alterative remedy, particularly in the scrofulous diathesis. Five oz. of the crystalline salt are dissolved in 12 fluidounces of syrup, and given in milk, in doses of 5 to 40 minims: 1, 2, or 3 grs. of the salt for young children, and rarely over 12 or 15 grains for adults.—Practitioner, 1885, 165; Pharm. Jour. and Trans., Oct. 3, 1885, 288.

Calx Sulphurata—Method of Examination, etc.—Mr. M. Jay has experimented upon calx sulphurata with several published *volumetric methods for estimating sulphides*, depending upon—

1. Complete precipitation by solution of zinc.
2. Reduction of ferric to ferrous sulphate, and titration with permanganate.
3. Partial precipitation of an arsenite as As_2S_3 , and titration of residual arsenic.

The results of the three methods of titration having been compared, the amount of sulphide present in 20 cc. of the solution used, when compared with decinormal solution, was found equivalent to—

14.85 cc. by titration with zinc.
14.73 “ “ “ permanganate.
14.25 “ “ “ iodine.

The three methods, therefore, agree satisfactorily, and the author selected the first to examine a commercial specimen of the compound, which he found to contain 43 per cent. of sulphide. The Pharmacopœia requires *not less* than 36 per cent. CaS. The author also made some experiments as to the preparation of calcium sulphide. Two specimens were prepared (as directed in the Pharmacopœia) by mixing 90 gm. of sulphur with 100 gm. of lime, and heating to low redness in a crucible with the lid luted on. 0.36 gm. of each product, after treatment with ammonia, required 16 and 18 cc. standard zinc solution respectively, indicating 16 and 18 per cent. of CaS. The lime was not perfectly fresh and it is probable that sulphur escaped with moisture or carbonic acid; yet the product satisfied the test as described in the Pharmacopœia. Other experiments made also gave unsatisfactory results. Amer. Jour. Pharm., May 1886, 231-233.

Carbonate of Lime—Solubility in Carbonic Acid.—Mr. Engle controverts the opinion generally held that the lowering of the tension of carbonic acid holding carbonate of lime in solution in water will necessarily determine a rapid precipitation of the lime salt from a saturated solution. He states that when operating with pure carbonic acid, the limit of solubility being attained under a certain pressure, the strength of the solution is lowered with extreme slowness upon diminishing the pressure. The cause of this he attributes to a fact noticed by Berzelius, that water free from atmospheric air, when charged with carbonic acid, gives up the gas very slowly upon being exposed to the air, but that the presence of atmospheric air promotes the escape of carbonic acid.—Pharm. Jour. and Trans., Nov. 28, 1885, 447; Compt. Rend., ci., 949.

Precipitated Carbonate of Calcium—Examination of Commercial Samples.—Mr. William C. Durkee has examined eleven commercial samples of precipitated carbonate of calcium, and found all but two of them to come up to the pharmacopœial requirements. One of them contained a considerable quantity of magnesium; the other sufficient organic impurity to make it undesirable in color. In connection with his present experiments the author remarks that some time since he had occasion to examine a cask of precip. carb. calcium, which was found to contain 33% of sulphate of calcium. The Pharmacopœia providing no direct test to reveal the presence of this compound, he suggests that at the next session a direct test for the detection of the sulphate should be provided.—Proc. Mass. State Pharm. Assoc., 1886, 167-170.

Prof. P. W. Bedford reports that he has examined eighteen samples of precipitated chalk during the course of the year, and that he found them all satisfactory, a few samples containing inappreciable quantities of magnesia.—Proc. N. Y. State Phar. Assoc., 1886, 198-199.

Whiting—Manufacture, etc.—Mr. Joseph W. England, after discussing

the uses to which whiting in its various forms is put, the sources of supply of the crude material, etc., gives an interesting account of the manufacture of whiting at one of the "whiting works" in the United States. He states that on its reception in the yards of the refining-works, the crude chalk is stored in wooden bins, from whence, as needed, it is placed on wheelbarrows and shoveled from there into large cylindrical tanks, through which a stream of water is constantly rushing, where it is ground in water by massive rotating disks of iron, weighing from 4 to 5 tons each.

From these tanks, by the current of running water, through an outlet on the side, flows the milky stream of suspended chalk, the impurities of silica and flint having to a large extent remained in the tank, from whence they are removed as occasion may require; the liquid is conducted through irregular, snake-shaped conduits, in order to separate the heavier, coarser particles of partly crushed chalk that may have been forced along by the current of liquid into a larger, longer and straight conduit, leading in succession to enormous wooden settling bins, having a volumetric capacity of over 5,000 gallons each of water. In the establishment visited, there were sixteen of these bins, placed successively along the whole side of the building. Now the running stream slowly flowing from the first to the last bin, through the long wooden channel provided for it and connected with each bin in its passage, gradually deposits by gravity, on standing, the coarse grade in the first, finer in the second, still finer in the third, and so on until the last bin is reached, where the deposit is very slow and the product obtained correspondingly fine.

At the base of each of these wooden bins are sluice-gates opening into large, square, open iron tanks in front, under which is conducted, by draught, a current of strongly heated air from kilns, placed in front, so regulated in temperature as never to exceed 300° F.

At the proper time, which ranges from five to six days for the first, to from six to eight months for the last, each bin is closed, the excess of water drawn off from above, and pumped to a large tank upon the roof of the building, for re-use in grinding crude chalk, and the sluice-gates below are opened to allow the white, viscid mass to flow into the flat, open tanks in front. As soon after heating as the mass becomes sufficiently plastic, it is cut into blocks of about one cubic foot, weighing 20, 30 or 40 pounds. The instrument used to do this division is technically called a "Scorer," and is simply a long, stout pole, at the end of which is attached an L shaped piece of iron. The mass is then again slowly heated, from beneath, to still further expel moisture.

From there these blocks are conveyed on tramways and taken to the drying-room above, where they are exposed on large trays to the continued draughts of atmospheric air, to promote thorough dryness; which point of the process is reached in one or more weeks, according to the

condition of the weather. Then these blocks are powdered, bolted, graded and packed in barrels of about 300 pounds each, for shipment, as kiln-dried whiting.

To a limited extent, in comparison with the previously described process, there is another mode of manufacturing practiced, whose only difference consists in the method of drying employed, which, in this instance, is done by simple exposure of the viscid, elutriated chalk to the air, without previously heating to expel contained moisture, and then proceeding as before mentioned. This product so obtained, is called air-dried whiting, in contradistinction to the kiln-dried body, and must of necessity contain a certain percentage of unexpelled moisture; the presence of which rendering it, by giving what is called "body," more fit for certain uses in the arts than the kiln-dried substance.

The author draws attention to the different grades of whiting and appends a table of whiting analysis. The ordinary chalk, in crude form, is mentioned as *A*. *A* No. 1, is "Commercial," the lowest grade made from chalk. *A* No. 2, is "Gilded," the next higher grade made from chalk. *A* No. 3, is "American Paris White," the finest grade of all made from chalk. On the other hand we have *B* as "Cliffstone," from which only one grade is made, and that is shown as *B* No. 1, "Cliffstone Paris White:"

TABLE OF WHITING ANALYSIS.

Grades.	Sp. gr.	Moisture (pr ct.)	Ca CO ₃ (pr. ct.)	Silica (pr.ct.)
<i>A.</i>				
No. 1, Crude Chalk	2.63	5, 10, 20	91, 86, 76	4.
No. 2, Commercial	2.5		96.5	3.5
No. 3, Gilded	2.38		97.	3.
No. 4, Am. Paris White.	2.32		98.	2.
<i>B.</i>				
No. 1, Cliffstone	2.63	5, 10, 20	90.5, 85.5, 75.5	4.5
No. 2, C. Paris White	2.5		96.	4.
<i>C.</i>				
No. 1, Creta Preparata (U. S. P.)	2.5		96.	4.
No. 2, Calcii Carb. Præc. (U. S. P.)	2.25		100.	

—Amer. Jour. Pharm., Feb. 1886, 77-81.

MAGNESIUM.

Magnesium—Use of the Metal in Fire Works.—A writer in Archiv. d. Pharm. (1885, p. 714) states that the addition of $2\frac{1}{2}$ per cent. of powdered magnesium entirely conceals the green flame produced by barium salts, giving them a bright white light, similar to the electric light; to the strontium flame it imparts an extraordinary brilliancy. The following formulas yield good results: *White Light.*—Shellac 1 part, nitrate of barium 6 parts; add $2\frac{1}{2}$ per cent. powdered magnesium. *Red Fire.*—Shellac 1 part, nitrate of strontium 5 parts; add $2\frac{1}{2}$ per cent. powdered

magnesium. The salts are mixed with the shellac, the mass fused and powdered; then the magnesium is added.—*Amer. Jour. Pharm.*, Dec. 1885, 605.

Magnesia—Solubility in Benzoate of Ammonium.—See *Benzoic Acid*, under “Organic Chemistry.”

Milk of Magnesia—Stable Preparation.—Mr. E. Dieterich states that a stable mixture is obtained by triturating 10 parts of calcined magnesia with 100 parts of distilled water, and adding 40 parts of glycerin.—*Amer. Drugg.*, March 1886, 57; from *Pharm. Centralh.*, 1885.

ALUMINIUM.

Aluminium—Manufacture by Electrolysis.—The following method is given in “*Chemisch-techn. Centr. Anzeiger*,” (iv, 322): A saturated solution of aluminium sulphate and a solution of sodium chloride, separated by means of a porous vessel, are acted on by a current from 6 to 7 voltas and 4 ampères. The double chloride of sodium and aluminium formed is decomposed, the aluminium settling on the negative electrode. This method can be employed for aluminium plating, and also for obtaining aluminium by a cheap process.

Aluminium—A New Alloy with Tin.—Mr. Bourbonze describes an alloy of aluminium, consisting of 100 p. Al and 10 p. Sn, which is white, only slightly heavier than pure aluminium (sp. gr. 2.85), and answers equally well for the construction of apparatus in which lightness is a requisite. It is even less acted on by most agents than aluminium, is easily worked, and can be soldered as easily as brass.—*Pharm. Jour. and Trans.*, June 26, 1886, 1088.

MANGANUM.

Manganese—Occurrence in Plants.—In a former paper (*Pharm. Jour. and Trans.*, 1872, 208) Professor Flückiger had called attention to the fact that manganese is to be met in every part of the plants belonging to the *Zingiberacea*, with few exceptions. In continuation of his researches in this direction he now finds that the curious *Trapa natans*, L., an annual herb growing in a limited number of localities in Europe, is remarkable for assimilating manganese from the water in which it grows, as iodine is assimilated by *Laminaria*. The plant lives in a very interesting way on the bottom of swamps, from which at the flowering time the leaves rise to the surface of the water. The cotyledons of the plant, known as the water-nut, are eaten in Upper Alsatia and the neighboring districts of France, as well as in northern Italy, and it is probable that they were an item of food of the inhabitants of the palafittes of Switzerland in prehistoric times. Two other species of *Trapa*—*T. bispinosa* and *T. bicornis*—are remarkable for playing an important part in the food of the inhabitants of Asia; the first named species in India, the second in

China and Japan. Prof. Flückiger was unable to secure specimens of the fruit or other parts of *T. hispinosa*; but has had opportunity to examine some fruits of *T. bicornis*, not from China proper, but from the mouth of the river Amur, and found the ash to give decided evidence of the presence of manganese.—Pharm. Jour. and Trans., Jan. 23, 1886, 621.

Manganese—Preparation of Oleate, which see under “Organic Chemistry.”

Permanganate of Potassium—Suitable Excipient.—See *Paraffin*, under “Organic Chemistry.”

Permanganate of Potassium—Value in Amenorrhea.—Dr. E. J. Doering makes the following statements, based upon his experience with the use of permanganate of potassium in the treatment of amenorrhea: (1) Permanganate of potassium in doses of from two to four grains, is an efficient emmenagogue, if administered for a period of not less than two weeks. (2) Its administration in doses large enough to be effectual is accompanied by severe pain, which frequently necessitates a discontinuance of the remedy, and hence impairs its value as an emmenagogue. (3) The most efficient method of administering the drug is in capsules, taken midway between meals, and followed by large draughts of some pure mineral water, like silurian.—Amer. Jour. Phar., Sept. 1885, 459; from Chic. Med. Jour. and Examiner.

Permanganate of Potassium—Use as a Reagent for Determining the Purity of Cocaine, which see under “Organic Chemistry.”

FERRUM.

Iron—Method of Determination by Means of Iodide of Potassium.—See “Iodine.”

Double (Scale) Salts of Iron—Improved Processes.—Mr. C. N. Lake, in reply to a query respecting the proper proportions to be used in the preparation of the scale salts of the U. S. Pharm., offers some suggestions which will be found in the following:

Citrate of Iron and Ammonia.—A more satisfactory article than that obtained by the officinal process is obtained if 1.8 parts of ammonia water are used for every 3 parts of citrate of iron. The solution, before scaling, should be very slightly acid.

Citrate of Iron and Quinine.—To make this salt so that it shall contain exactly 12% of quinine, the author considers it necessary to use 12.5 parts of the alkaloid. The hydrated ferric oxide for the citrate which is to be used for this compound should be most carefully washed so as to completely free it from ammonia.

Tartrate of Iron and Ammonia.—The Pharmacopœia directs 60 parts of tartaric acid, which the author finds in excess to the ferric hydrate obtained. The proper quantity is 58 parts.

Pyrophosphate of Iron.—The Pharmacopœia directs 10 parts of pyrophosphate of soda to 9 parts of citrate of iron. The author states that a better preparation, which is easily scaled and has a bright green color, is obtained by employing 7.6 to 8 parts of pyrophosphate of sodium, instead of 10 parts.

Phosphate of Iron.—Instead of employing 6 parts of phosphate of sodium, the author recommends the use of 4 to $4\frac{1}{2}$ parts of this salt to 5 parts of citrate of iron, obtaining similarly good results as in the case of the pyrophosphate.

The author observes that he has found the above modifications to give uniformly good results in an extended experience with large quantities of material.—Proc. N. Y. State Pharm. Assoc., 1886, 167-170.

CHROMIUM.

Chromic Acid—Action on Oil of Turpentine—which see under “Organic Chemistry.”

Bichromate of Potassium—Value in Syphilis.—Dr. Güntz speaks highly of this drug in cases of syphilis which resist treatment with mercury, and in which the constitution has been badly broken down by the disease. Not only is there a complete absence of general disturbance after the use of chromium, but, according to the writer, the cure is rapid and complete. The daily amount which he employs is half a grain of potassium bichromate, divided into four doses. Dr. Güntz denies that headache ever followed the use of the drug.—Amer. Jour. Pharm., Sept. 1885, 459; from “Memorabil.,” through N. Y. Med. Jour., June 6, 1885.

Bichromate of Sodium—Advantages over the Potassium Salt.—Professor W. Simon draws attention to bichromate of sodium, which has the advantage over bichromate of potassium not alone in that it is far more readily soluble—being in fact hygroscopic—but also that it is a more energetic oxidizing agent. Its composition is $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$. It melts by gentle heat, and on continued heating loses all of its water of crystallization. The salt is prepared in a manner analogous to that employed for the preparation of the potassium salt.—Pharm. Rundsch., Jan. 1886, 3-4.

ZINCUM.

Pure Zinc—Properties.—L'Hôte obtained pure zinc by distilling a mixture of pure precipitated oxide of zinc and lampblack. Pure zinc does not generate hydrogen when boiled with water, nor is it affected by dilute sulphuric acid. When pure zinc is melted and stirred with an iron rod, the small quantity of iron which adheres to the zinc generates hydrogen when boiled with water, and is affected by dilute sulphuric acid. Arsenic and antimony affect it similarly. All varieties of commercial zinc decompose water on boiling.—Amer. Jour. Pharm., March 1886, 127; from Chemiker Zeitung, 1886, x., p. 2.

Zinc—Non-action upon Water when Absolutely Pure.—The conflicting statements respecting the capability of zinc to decompose water, have induced Mr. L'Hôte to experiment with a view to determine the exact relations of the one to the other. He accordingly prepared some chemically pure zinc by testing precipitated oxide of zinc with lampblack previously heated to redness and distilling, and found that this pure zinc when heated with water gave no evolution of hydrogen whatever, even by prolonged boiling. Moreover, the pure zinc was not attacked even by dilute sulphuric acid. But the chemical properties of the metal were completely modified by the introduction of a minute quantity. It was sufficient for this purpose to simply stir the fused zinc with an iron rod before granulating it; for, although on titration with dilute permanganate solution, the zinc showed only two or three parts per thousand of iron, it decomposed boiling water, with evolution of hydrogen, and was also attacked by dilute sulphuric acid. The presence of a minute quantity of arsenic or antimony was found to modify the properties of zinc similarly to iron. The author found that all commercial zinc decomposes water when boiled with it. He suggests that his observations might be utilized in cases when in using the Marsh apparatus, the zinc is attacked with difficulty; instead of adding a little metallic salt, which might introduce arsenic, he would prefer to remelt the zinc and stir it with an iron rod.—Pharm. Jour. and Trans., Dec. 26, 1885, 544; Compt. Rend., ci., 1153.

Zinc—Character and Preparation of the Oleate, which see under "Organic Chemistry."

Hydrated Sulphide of Zinc ($\text{ZnS} \cdot \text{H}_2\text{O}$)—*Preparation, etc.*—The hydrated sulphide of zinc is precipitated from alkaline solutions of zinc by hydrosulphuric acid or ammonium sulphide, and forms a white powder, which oxidizes slowly on exposure to the air. Taken internally it is decomposed by the gastric juice, causing eructations of hydrogen sulphide. Mr. Pierre Vigier recommends the use of this compound, and suggests formulas for *pills*, *dusting powder*, and *ointment*, which see under "Pharmacy."—Amer. Jour. Phar., June 1886, 294; from Gaz. hebdom. Méd. Chir., Febr. 5, 1886.

CUPRUM.

Copper—Separation from Cadmium.—Mr. A. Béhal states that the following easy method may be used for quantitative analysis: If to a solution of a copper and a cadmium salt a strong alkaline solution of sodium tartrate is added, no precipitate is formed except a faint turbidity disappearing while shaking. On boiling this solution all the oxide of cadmium is precipitated, while the copper is retained in solution. The white $\text{Cd}(\text{OH})_2$ which settles rapidly, is collected, washed with a little water and dissolved in NH_4OH , and this ammoniacal solution, treated with ammo-

mium sulphide or H_2S , gives the characteristic yellow precipitate of CdS . Ammoniacal salts prevent precipitation; in this case the solution of the tartrate is rendered strongly alkaline and then boiled, when the ammonia escapes and the precipitate is formed.—*Amer. Jour. Pharm.*, Aug. 1885, 382; from *Rép. de Pharm.*, No. 6, 1885.

PLUMBUM.

Lead—Presence in Material used in the Manufacture of Aerated Waters.—Mr. W. I. Macadam draws attention to the fact that he has found lead to be present in sugar, citric acid, tartaric acid, and oil of lemon. While the quantity is quite small in most cases, its presence even in the minutest quantities is to be deprecated, since the substances enumerated are employed largely in the manufacture of aerated beverages.—*Yearbook of Pharm.*, 1885, 451-454.

Lead Salts—Absorption and Retention by Filter Paper.—Mr. L. Trant O'Shea, having observed that solution of lead salts showed a smaller percentage of lead after filtration than before being filtered, was led to make some experiments which proved that filter paper retained an appreciable quantity of the lead salts when their solutions are filtered, and that the quantity varies with different filter papers. The author gives his results in the form of tables which afford an interesting subject for study.—*Phar. Jour. and Trans.*, May 29, 1886, 1022-1023.

Basic Lead Acetate—Preparation.—See under "Organic Chemistry."

STANNUM.

Tin—Delicate and Characteristic Test.—Mr. Otis C. Johnson recommends the following as a test for tin which is both delicate and characteristic: Add potassium hydrate in excess to the solution under examination, and then some ammoniated solution of nitrate of silver, when, in the presence of tin, a black precipitate of metallic silver is formed. If the stannic salt is present it must be reduced to the stannous salt.—*Proc. Mich. State Pharm. Assoc.*, 1885, 149.

Tin-foil—Presence of Lead.—Prof. A. Hilger communicates the results of an examination of the metallic caps covering the corks of mineral water bottles containing a popular mineral water from France. The results show the foil to be composed of lead containing 5% of tin.—*Archiv d. Pharm.*, Nov. (1) 1885, 826.

Stannous Chloride—Use as a Disinfectant.—Dr. Abbott recommends stannous chloride as a disinfectant, on the ground that it is cheap, tolerably safe, and does not corrode lead pipes. It is said to be considerably more active than chloride or sulphate of zinc, or the sulphates of copper and iron. To prevent the formation of oxychloride during prolonged keeping it should be mixed with an equal quantity of chloride of ammonium.—*Med. Chron.*, June 1886, 252.

Bichloride of Tin—Poisonous Action.—Experiments made by Mr. Patenke show that whilst tin in the pure metallic state may be regarded as harmless, this is not the case with the bichloride. Three-fourths of a grain of the bichloride injected into the veins of frogs, guinea pigs and dogs, rapidly produced death, but rather larger doses introduced into the stomach with food only caused indigestion. Injected subcutaneously in small and diluted doses it caused local anæsthesia, but stronger solutions produced gangrene, which penetrated deeply. The author's experiments seem to show that bichloride of tin acts on the central nervous system and muscles.—*Lancet*, March 6, 1886, 455.

VANADIUM.

Vanadic Acid—Compounds with Sulphuric and other Acids.—According to Mr. Ditte the dark-brown clear liquid obtained by dissolving anhydrous vanadic acid in strong sulphuric acid, is a supersaturated solution of a compound of the two acids that eventually separate in a crystalline form. Analogous crystalline compounds of vanadic acid with phosphoric, arsenic, iodic and molybdic acids were also obtained. Compounds of vanadic acid with tungstic, silicic, oxalic, and tartaric acids were obtained in form of salts, but not in the free condition.—*Pharm. Jour. and Trans.*, May 1, 1886, 921; *Compt. rend.*, cii, 757.

ARSENICUM.

Arsenic—Simple Test.—Mr. Otis C. Johnson recommends the following simple test for the presence of arsenic. The substance is introduced into a suitable vessel (a test tube), with a little aluminium wire in alkaline solution. Arsenuretted hydrogen is evolved, and its presence revealed by placing a piece of filter paper, moistened with nitrate of silver, over the mouth of the tube. Aluminium is found in the market always free from arsenic.—*Proc. Mich. State Pharm. Assoc.*, 1885, 149.

Arsenic—Improved Method of Testing.—Mr. Albert Altenberg, after reviewing the usual methods of testing for arsenic, and drawing attention to causes of error, proposes the following simplified method as giving correct results: The suspected substance is put into a flask with very long neck and placed in an oblique position, together with 1 to 2 gm. of ferrous sulphate and hydrochloric acid of 1.190 spec. grav., and the mixture distilled. The flask is connected with a perpendicularly placed pipette, the point of which just dips below the surface of 200 cubic centimeters of water contained in a glass flask. As soon as the pipette becomes hot, the distillation is terminated. The distillate is now mixed with nitric acid and evaporated to dryness. If arsenic was present, the whole of this remains in the residue as arsenic acid. The latter is at once recognized by dissolving the residue in water and adding nitrate of silver. If a precipitate of arseniate of silver does not occur immediately,

the whole is again evaporated to dryness, when, if arsenic was present, the characteristic color of arseniate of silver will appear quite sharply. In case organic substances should have passed into the distillate, the arsenic residue may contain oxidation products, such as oxalic acid. And if sulphur had passed into the distillate, the residue may contain sulphuric acid. These substances, however, do not interfere with the silver reaction, provided enough silver nitrate is added so that, on drying, the foreign acids are all combined with silver.—*Amer. Drugg.*, Aug. 1885, 153; from *Rep. d. Anal. Chem.*, 1885, No. 12.

Arsenic—Detection in Wall-paper, etc.—The following method is given by the official analyst, at Stockholm, as conforming to the Swedish law respecting the determination of arsenic in wall-paper and other fabrics: 100 square centimeters of wall-paper (supposing this to be the object of the analysis), or 3 gm. (45 grains) of wall-paper color dried at 100° C. (212° F.) are placed into a flask having the capacity of about 300 cc. (10 fl. oz.) and 4 gm. (60 gr.) of crystallized sulphate of iron, together with 50 to 100 cc. (14 to 28 fluidrachms) of hydrochloric acid, spec. gr. 1.100, are added. Of course, all the utensils and reagents must have been previously ascertained to be absolutely free from arsenic. As soon as the material to be examined has been thoroughly penetrated by the acid, the flask is closed with a cork (not rubber) stopper, bearing the bent glass-tube, to which is attached a 50 cc. pipette (the usual form, having an elongated bulb in center), which dips with its point about 1 cm. ($\frac{1}{2}$ inch) below the surface of 100 cc. of distilled water contained in the beaker. The contents of the flask are then heated to boiling and the distillation so adjusted that it is completed in ten or fifteen minutes. At this time the upper part of the pipette must feel quite hot; if it is not, the distillation must be continued until this point is reached.

The contents of the beaker are then mixed with 100–150 cc. of hydrosulphuric acid water, as concentrated as possible, and the whole set aside for twelve hours. All sulphide of arsenic will by that time have been deposited, and the liquid is then passed through a small filter (5–6 cm.). The sulphide of arsenic remaining on the filter is washed thoroughly, and then dissolved in sulphide of ammonium. The resulting solution is transferred to a watch-glass, mixed with soda and dried at 100° C. (212° F.). When the mass is thoroughly dry, it is intimately mixed with soda and cyanide of potassium (equal parts of each), transferred to a reduction tube, and the mixture there reduced by ignition, a stream of dry carbonic acid gas passing through the apparatus. The reduction tubes are rather wide at one end and diminish at the other, and are provided, at about one-third the distance from the wide to the narrow end, with a bulb, into which the mixture is introduced through the wider end. The current of gas likewise enters at the wide end. When the mixture is melted, the metallic arsenic which volatilizes produces a mirror at the point of the

narrow tube just beyond the bulb. At this point the diameter of the tube should not exceed 1.5 to 2 millimeters. Special attention should be paid to see that the glass of the tube is free from arsenic, a condition which is fulfilled by but very few samples of glass. This method yields good results. If the reagents are pure, there is a loss of 0.04 milligrammes of arsenious acid, in consequence of the solubility of sulphide of arsenic in the volume of liquid from which it is precipitated.—*Amer. Drugg.*, May 1886, 82; from *Chem. tech. Central-Anzeiger*, Dec. 17, 1885.

Arsenic—Indefinite Character of the Oleate, which see under "Organic Chemistry."

Arsenious and Arsenic Acids—Compounds of the Two.—Mr. A. Jolly observes that when arsenious acid is oxidized with nitric acid, an acid liquid results, which sometimes still contains arsenious acid, which latter may be recognized by the fact that the liquid still has reducing properties. On concentrating such a solution, small needle-shaped crystals are separated which have the composition $2\text{As}_2\text{O}_5 \cdot 3\text{As}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$. This compound may be obtained in larger quantity by gently heating 100 gm. of arsenious acid with 25–30 cc. of concentrated nitric acid. Soon after the reaction has begun, and red vapors are evolved, the mixture congeals to a mass consisting of the above mentioned compound and arsenious acid. When brought in contact with water the compound is split into its constituents. This is, however, not the only compound which may be formed by the two bodies. If a large quantity of arsenious acid is left unoxidized, a compound results, crystallizing in rectangular scales, having the composition $\text{As}_2\text{O}_5 \cdot 2\text{As}_2\text{O}_3 \cdot \text{aq.}$ But if arsenic acid is in excess, fine crystals of $\text{As}_2\text{O}_5 \cdot \text{As}_2\text{O}_3 \cdot \text{aq.}$ result. Both of these compounds are likewise decomposed by water.—*Jour. f. prakt. Chem.*, 1885, 432.

Arsenites of Iodide or Bromide of Potassium—Definite Constitution.—Messrs. Hugo Schiff and R. Sestini have found that, from 20 per cent. solutions of arsenite and iodide of potassium, or of arsenite of potassium and iodine, or more dilute solutions of arsenious acid and iodide of potassium, there results a white powder or crust, which on analysis turns out to be compound, only contaminated with a little arsenite of potassium (K_2HAsO_3), containing either $4\text{As}_2\text{O}_3 \cdot 2\text{KI}$, or $\text{As}_2\text{O}_3 \cdot 2\text{KI} \cdot \text{H}_2\text{O}$, that is, either anhydrous or monohydrated arsenite of iodide of potassium. From arsenite of potassium and bromide of potassium or bromine, a similar body is produced, having the composition $4\text{As}_2\text{O}_3 \cdot 2\text{KBr}$.—*Ber. d. D. Chem. Ges.*, xviii, 262.

ANTIMONIUM.

Oxide of Antimony—Solubility in Alkaline Glycerin.—Dr. Koehler finds that oxide of antimony, like the oxides of iron, manganese, copper, and bismuth, is soluble in alkaline solutions of glycerin. In order to test

whether the solution was due to the alkali alone, small quantities of oxide of antimony were treated with strong soda solution, as well as with the fused hydrate, but scarcely any was dissolved. The author is engaged in experimenting with a view of using such a solution in calico printing in the place of tartar emetic.—Phar. Jour. and Trans., June 26, 1886, 1088; Mon. Scient., June 1886, 657.

Antimonii Sulphidum—*Examination, etc.*—Mr. E. G. Eberhardt has examined five commercial samples of sulphide of antimony, only one of which was found genuine; the rest did not yield a trace of antimony.

The Pharmacopœia directs the preparation of “purified sulphide of antimony.” The only one mentioned being the preparation of

Antimonium Sulphuratum. The author considers that the former might readily be discarded, and the latter might be made more directly by treating the native sulphide in hydrochloric acid, and precipitating with sulphuretted hydrogen. By this process the prolonged maceration with ammonia can be omitted, and a nearly definite chemical substance results. The most apparent objection is the possibility of dissolving arsenic in hydrochloric acid, and this danger was subjected to careful examination. A sample of ordinary sulphide was purified by the pharmacopœial process; another portion was dissolved in hydrochloric acid and re-precipitated by sulphuretted hydrogen. Both products met all the requirements for “purified sulphide,” though both contained arsenic, as shown by Fleitmann’s test. The question arises whether the traces of arsenic are deleterious. Sulphurated antimony is alterative and emetic; alterative in small doses, and this effect would be increased by a small quantity of arsenic; and even the larger emetic doses would not contain a dangerous quantity of arsenic; for any harm from the latter would be obviated by the emetic effect of the antimony.—Amer. Jour. Phar., May 1886, 229, 230.

Black Sulphide of Antimony—*Examination of Commercial Specimens.*—Mr. S. W. M’Keown has examined different commercial specimens of black sulphide of antimony. He finds that the article which is sold to the trade at the remarkably low price of from four to six cents per pound is simply a mixture of marble dust and anthracite coal, in a proportion of from 18 to 33 per cent. of coal to 82 to 67 per cent. of marble dust. One sample that he analyzed a few months ago, had the following composition :

Carbonate of Lime.	44.14
Carbonate of Magnesia.	35.07
Oxide of Iron and Alumina.	0.34
Insoluble Silicates.	3.68
Carbonaceous Matter.	15.92
Sulphide of Antimony.	0.85

The presence of the sulphide of antimony may have been the result either of accident or design. Another sample contained marble dust two parts and coal (anthracite) one part, and not even a trace of antimony. An analysis of the marble dust used in preparing carbonic acid gas for the soda fountain proved it to have a similar composition to the marble used in the two samples mentioned, being magnesian marble or dolomite. Three samples of genuine black antimony were examined. One was found to contain 27.28 per cent. impurity, mostly silicious, another 23.84 per cent. silicious matter, and a third marked antimony ore, 71.94 per cent. quartz, etc.—*Amer. Drugg.*, July 1885, 128; *Proc. Ohio State Pharm. Assoc.*, 1885.

BISMUTHUM.

Bismuth Salts—Contamination with Arsenic.—Mr. D. L. Haigh has subjected five samples of subnitrate of bismuth, purchased at different places, to examination for arsenic, and found all of them to contain more or less. In the case of four of them the amount present was 0.02, 0.04, 0.04, and 0.06% respectively. In that of the fifth sample the amount was not weighable. It would appear from these results that, while arsenic is uniformly present in subnitrate of bismuth, the amount is so small as to be of very little moment.—*Proc. N. Y. State Pharm. Assoc.*, 1886, 203–204.

Bismuth Carbonate—Determination of Silver.—Mr. Otis C. Johnson recommends the following method for determining silver in carbonate of bismuth, which is dependent on the observation that silver chloride is comparatively soluble in the presence of bismuth chloride. The carbonate is dissolved in hydrochloric acid, and stannous chloride added, when the whole of the silver will be thrown down in the metallic state, whilst the bismuth remains in solution.—*Proc. Mich. State Pharm. Assoc.*, 1885, 148–149.

Bismuth Oxycarbonate—Presence of Oxynitrate.—Mr. L. W. Hawkins reviews the different processes for the preparation of subcarbonate of bismuth, and communicates the results of the examination of commercial specimens for the presence of subnitrate. Seven specimens examined by Pelouze's method, as modified by Frosenius, gave indications of the presence of subnitrate, varying in quantity from 3.39% to 13.02%. An eighth specimen, prepared by the author by the exact directions of the B. P., contained only 0.38% of subnitrate.—*Phar. Jour. and Trans.*, June 19, 1886, 1077–1078.

Bismuth Subnitrate—Contamination with Chloride.—See *Citrate of Bismuth*, under "Organic Chemistry."

Phosphate of Bismuth—Preparation, etc.—Mr. Fredenat recommends phosphate of bismuth in place of the subnitrate, for the reason that the former salt is of more uniform and constant composition than the latter,

and that it can also be more readily examined for impurities. It being almost insoluble in dilute acids, even on boiling, such adulterations as carbonate of calcium or magnesium, or phosphate of calcium, could be quickly detected by treating the salt with dilute acetic acid. Phosphate of bismuth may be prepared by gradually adding to a boiling solution of acid nitrate of bismuth, a solution of (ortho) phosphate of potassium [or sodium], until a precipitate is no longer produced, and afterwards washing the precipitate until it no longer has an acid reaction. When dried, the salt appears in form of a granular, white, and heavy powder—*Pharm. Zeit.*, No. 79, 1885.

Bismuth—Combination with Pepsin in form of an Elixir, which see under "Pharmacy."

HYDRARYGRUM.

Mercury—Action of its Compounds in the Animal Organism.—Dr. Richard Fleischer, in a study of the modification undergone by preparations of mercury in the animal economy, adduces the following facts as the results of his experiments: (1) Calomel, which in pure water is insoluble, in the presence of chloride of sodium is dissolved and transformed into the bichloride of mercury. (2) The formation of mercuric chloride is favored by a high temperature—*i. e.*, the temperature of the body. (3) The amount of mercuric chloride produced is minute, but plainly recognizable. (4) Dilute hydrochloric acid of a strength of 25 per cent. converts only a minimum portion of calomel into the bichloride. A solution of a strength of 4 per cent. is much more active. (5) By mixture of potassium iodide and calomel, iodide of mercury is produced. The double salt produced is soluble in excess of potassium iodide, but separates in pure water into the insoluble oxide of mercury and into iodide of potassium. (6) The oxide of mercury forms with chloride of sodium, corrosive sublimate and caustic soda.—*Deutsche Med. Wochenschrift*, Sept. 3, 1885; *Med. Chron.*, Dec. 1885, p. 229.

Calomel—Commercial Quality.—Mr. J. Hungerford Smith has examined calomels of English and American manufacture. He found in some cases mere traces of corrosive sublimate, but in his opinion, not sufficient to materially impair the calomel. He has found no material difference between English and American calomels.—*Proc. N. Y. State Pharm. Assoc.*, 1886. 174-175.

Mercuric Chloride—Volatility at the Ordinary Temperature.—Mr. D. B. Dott finds that the loss in weight of mercuric chloride at ordinary temperature is extremely slow. In twenty-one days it amounted to only .053 per cent. = 0.0001 per cent. in the hour. At the temperature of the water-bath the loss was equivalent to 0.50 per cent. per hour.—*Yearbook of Pharm.*, 1885, 417.

Corrosive Sublimate—Use as a Dressing for Wounds.—Dr. Heyden-

reich strongly recommends corrosive sublimate, mixed with sugar in the proportion of 1:1000, as a first dressing for wounds on the field of battle. It is claimed that sugar is the best substance for diluting the sublimate, being itself somewhat antiseptic, whilst the mixture though perfectly innocuous is powerfully antiseptic, and is suitable for use wherever water is available. The equal distribution of the corrosive is best effected by dissolving it in a little spirit and carefully rubbing up the sugar with it.—Pharm. Jour. and Trans., June 26, 1886, 1087; Lancet, June 12, 1886, 1135.

Mercurous Iodide—Preparation.—According to Mr. George A. Haffa this compound is best made by precipitation of mercurous nitrate with potassium iodide, and may then be obtained of a yellow or green color according to the density of the solution. The solution of mercurous nitrate is prepared by acting upon 15,000 grs. of mercury with a cold mixture of nitric acid 6,000 grs., and water 4,000 grs., placing the vessel in cold water and stirring the contents constantly until the reaction has entirely ceased; the white crystalline mass, without being separated from the excess of metallic mercury, is then dissolved in water acidulated with nitric acid (1 oz. to the gallon) until the solution measures four pints.

For preparing *green* mercurous iodide, mix solution of mercurous nitrate 6 oz. with water 6 pints, and add to it in a continuous stream and with constant stirring, a solution of potassium iodide 3 oz. in water 54 oz., decant, wash the precipitate with water and dry without the aid of heat.

For preparing *yellow* mercurous iodide operate in the same manner, but use solution of mercurous nitrate 2 oz. diluted with water 8 pints, and a solution of potassium iodide 1 oz. in water 4 pints. This salt darkens much more quickly when exposed to the light than that made by the pharmacopœial process.—Amer. Jour. Pharm., Jan. 1886, 12; from the author's thesis.

Hydrargyrum Iodidum Viride—Commercial Quality.—Mr. A. H. Cohn has examined three commercial samples of green iodide of mercury, and all were contaminated, more or less, with mercuric iodide. The following test was applied to detect the mercuric salt.

A definite quantity of the powder was shaken with alcohol. The filtrate was evaporated upon a watch crystal between 70° and 80° C.

Specimen 1 contained .5 per cent. of mercuric iodide.

"	2	"	.3	"	"	"	"
"	3	"	.2	"	"	"	"

A specimen prepared by the author according to the Pharmacopœia contained no mercuric salt. No doubt most mercurous iodide sold in retail stores has been kept for some time, and consequently the mercurous iodide is changed into the mercuric.—Amer. Jour. Phar., May 1886, 235.

Mercurous Iodide—Influence of Light.—The experiments of Dr. Eder show that pure mercurous iodide is rapidly blackened under the action of light, even when placed in tubes filled with dry carbonic acid or nitrogen at a temperature of 100° C. and sealed, so that neither oxygen nor moisture could have played a part in the change. The altered compound contained traces of metallic mercury, but alcohol removed no mercuric iodide, nor was there free iodine or hydriodic acid. Dr. Eder therefore thinks the decomposition must be into metallic mercury and a compound of mercurous and mercuric iodide.—Pharm. Jour. and Trans., Oct. 3, 1885, 285; from Monatshefte, vi, 495.

Biniodide of Mercury—Solubility in Certain Fatty Bodies, etc.—Mr. C. Méhu has made some experiments on the solubility of biniodide of mercury in various fixed oils, petrolatum, etc., the results of which may be briefly stated as follows:

Oil of Sweet Almonds, while dissolving much larger quantities by the aid of heat, will not retain much more than 4 p. in 1000 p. of the oil when exposed to the conditions of cold liable to occur in practice.

Olive Oil behaves nearly like oil of sweet almonds.

Poppy Seed Oil appears to retain very readily 10 p. of biniodide in 1000 p.

Nut Oil will retain in the cold still more, viz., 13: 1000.

Castor Oil retains readily $\frac{1}{10}$ of its weight, viz., 20: 1000, and the solubility may be further increased by the addition of iodide of potassium, as well as by bichloride of mercury.

Lard will retain about 4.5 p. in the 1000.

Petrolatum (vaselin) will retain only 1 p. in 4000.

Carbolic Acid will probably retain nearly 10 parts in 1000. Accurate determination could, however, not be made on account of the solid condition of the cold mixture.

Benzin retains 4 p. in 1000.—Pharm. Jour. and Trans., Oct. 17, 1885, 327, 328.

Bromides of Mercury—Preparation.—Mr. Eugene Dieterich gives directions for preparing mercurous and mercuric bromides, as follows:

Mercurous Bromide.—Take of mercurous nitrate, 100 p.; nitric acid, 15 p.; bromide of potassium, 43 p.; distilled water, q. s. Triturate the mercurous nitrate in a mortar or capsule with the nitric acid, gradually add 500 parts of the water, and effect solution, if necessary, by gently warming. Also prepare a solution of the bromide of potassium in 500 parts of the water. Pour both solutions, together, in a thin stream, and under agitation, into a capacious vessel containing 100 parts of the water. Allow the precipitate to subside, draw off the supernatant liquid with a siphon, then wash by decantation until blue litmus paper ceases to be

turned red. Collect the precipitate upon a filter, and dry *in a dark place*, at a temperature of 30° to 35° (86° to 95° F.). [The whole process should be carried out with artificial light.] The yield is about 95 parts. The product should be preserved in bottles of brown or black glass.

Mercuric Bromide.—Take of mercury, 100 p.; bromine, 85 p.; distilled water, q. s. Into a glass-stoppered bottle introduce the mercury, bromine, and 200 parts of the water, and shake until the metal has become changed into a whitish powder. Transfer the contents to a flask, rinse the bottle with 800 parts of the water, boil four or five minutes, then, if there should be anything undissolved, allow to settle, and filter through glass-wool. Treat the residue that may have remained in the flask with 500 parts of water, and filter. Evaporate the united filtrates at 40° C. (104° F.), until a pellicle forms on the surface, then set aside to crystallize. Concentrate the mother liquors, and continue the process as long as crystals can be obtained. Dry the crystals *in a dark place* at a temperature not exceeding 25° C. (77° F.), and preserve them in bottles of brown or black glass. The excess of bromine is necessary, because some of the latter is soluble in water, and the solution of bromine thus produced is too dilute to act on the mercury. For this reason, also, only a small quantity of water must be employed at first, and more should not be added until the bromine has combined with the mercury.—Pharm. Centralh., No. 46, 1885.

Nitrate of Mercury—*Use in the Examination of Essential Oils*, which see under “Organic Chemistry.”

Mercuric Sulphites—*Constitution, etc.*—According to Messrs. Edward Divers and Tetsukichi Shimidzu, the mercuric sulphites are not ordinary salts, either in formation, composition or reaction, and they supply many facts serving for the determination of the constitution of non-saturated oxygenous salts. The mercuric radicle, Hg, takes up and preserves a non-oxylic relation to sulphuryl with an energy comparable to that it exerts in its cyanide and iodide; this is the central conception in the chemistry of the mercury sulphites, and the authors are of the opinion that without it all the peculiarities of these salts stand unexplained.—Pharm. Jour. and Trans., Jan. 30, 1886, 658.

Mercurous and Mercuric Tannates—*Methods of Preparation*.—See *Organic Acids*, under “Organic Chemistry.”

ARGENTUM.

Silver Nitrate—*Characters, etc., of Double Salts with Nitrates of the Alkalies*.—Mr. A. Ditte has studied the double salts formed by silver nitrate with the nitrates of the alkalies.

Potassium Nitrate.—When a solution containing silver and potassium nitrates is slowly concentrated, potassium nitrate at first crystallizes

alone, but as soon as the liquid contains at least 3 mols. of silver nitrate for each mol. of potassium nitrate, bulky, transparent, right rhombic prisms are formed. These prisms are highly modified and have the composition $\text{AgNO}_3 \cdot \text{KNO}_3$. This double salt is always formed when a solution of the two nitrates contains so much of the silver salt that both nitrates can crystallize simultaneously. If the double salt is treated with water, the silver nitrate is gradually removed.

Rubidium Nitrate.—Rubidium nitrate yields a strictly analogous double salt, and in all probability cesium nitrate will behave in the same way.

Ammonium Nitrate.—If a solution of silver and ammonium nitrate is gradually concentrated, the silver salt, being less soluble, crystallizes alone, but after a time the double nitrate $\text{AgNO}_3 \cdot \text{NH}_4\text{NO}_3$, separates in crystals similar to those of the potassium compound. This double salt is easily obtained whenever the mixed solutions contain an excess of the ammonium salt.

Sodium Nitrate.—The author finds that when the silver nitrate is in excess, this salt crystallizes alone in its ordinary form, but as soon as sodium nitrate begins to separate also, the two salts crystallize together, and the crystals take the ordinary form of sodium nitrate. Whatever the original composition of the solution, the composition of the crystals and the mother-liquor varies continuously, however, and no definite compounds are formed. From this result it follows that silver nitrate is dimorphous, and that one of its forms is isomorphous with sodium nitrate, but the author has not been able to obtain pure silver nitrate in rhombohedrons.

Lithium Nitrate.—Lithium nitrate crystallizes below 10° in prismatic needles containing $5\text{H}_2\text{O}$, and if a mixture of silver and lithium nitrates is allowed to crystallize at this temperature, the two salts crystallize separately. Above 15° , however, lithium nitrate forms anhydrous crystals similar to those of sodium nitrate, and if a solution of silver and lithium nitrates is concentrated at this temperature, the two salts crystallize together in rhombohedrons, but the composition of the crystals and the mother-liquor varies continuously as in the case of sodium nitrate.—*Jour. Chem. Soc.*, 1886, p. 122; *Compt. Rend.*, ci., 878–881; *Amer. Jour. Phar.*, March 1886, 151.

Silver Salts—Suitable Excipient.—See *Paraffin*, under “Organic Chemistry.”

AURUM.

Chloride of Gold and Sodium—Examination of Commercial Samples.—Mr. Alfred Conard Wood has examined two commercial samples of chloride of gold and sodium, and found them to agree in all respects with the pharmacopœial requirements, except the percentage of metallic gold, which was ascertained as directed by the Pharmacopœia, by treating a solution of 0.5 gm. of the salt with a clear acidulated solution of 2 gm. of ferrous sulphate.

No. 1 yielded 0.125 gm. gold=25 per cent.; deficiency 7.4 per cent.

No. 2 " 0.110 " " =22 " " 10.4 "

—Amer. Jour. Pharm., Jan. 1886, 12; from the author's thesis.

OSMIUM.

Osmate of Sodium—*Use as a Substitute for Osmic Acid*.—This salt, which is now prepared in Germany, appears to have advantages over the free osmic acid, which, besides being very irritating to the air passages, is also very hygroscopic. Osmate of potassium has the composition $K_2OsO_4 \cdot 2H_2O$. Both the acid and this salt are used for the same purposes. Neuber has employed them with great success hypodermically, in peripheral neuralgia, and Mohr against rheumatic sciatica, the latter using a 1 per cent. aqueous solution. In goitre, subcutaneous injections are recommended by Szumann and Eulenburg, and in sarcoma and leucoma by Delbastille. Recently it has been recommended by Wildermuth for the treatment of epilepsy, with simultaneous administration of bromide of potassium. He gave it internally, in doses of $\frac{1}{4}$ grain, altogether $\frac{1}{4}$ grain per day, in pills made with white bole, and coated, if possible. When too long exhibited, the remedy may produce disturbance of the digestive organs.—Amer. Drugg., April 1886, 71.

NEW ELEMENTS.

Germanium—*A New Element*.—Mr. Clemens Winkler discovered in argyrodite—a silver ore—a new element resembling arsenic in color and lustre, yet less volatile than antimony; when sublimed, it yields crystals totally different from antimony. Pure germanium sulphide is a snow-white mass, soluble in ammonia. Germanium chloride is more volatile than antimony chloride, and yields a white precipitate with sulphuretted hydrogen in acidified solution.—Pharmaceutische Post, xix, 140; Amer. Jour. Phar., April 1886, 167.

Didymium—*Separability into Two Metals*.—Dr. Von Welsbach announces that he has separated didymium into two distinct metals by a process of fractional crystallization of a mixture of the nitrates of didymium and lanthanum in nitric acid after treatment with nitrate of ammonium and sodium. The new elements appear to be present in didymium in unequal proportions. The least abundant, for which the name

Praseodymium (Pr) is proposed, is described as forming leek-green salts, whilst the salts of the other, named

Neodymium (Ne), are of an intense amethyst-red color. The two new elements are said to differ considerably in respect to their atomic weights, and in solution they give absorption bands that represent in their sum the absorption-bands attributed to didymium.—Phar. Jour. and Trans., Oct. 3, 1885, 286; from Monatshefte, vi, 477.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(Including Volatile Oils.)

Petroleum—Presence of Cumol and Mesitylene.—According to C. Engler, American petroleum contains a little over 0.2 per cent. of *pseudo-cumol* and *mesitylene*. The two hydrocarbons are also present in Caucasian petroleum, and it is very probable that cumols and other homologues of benzol are present in all rock oils.—*Amer. Jour. Pharm.*, Feb. 1886, 92; from *Ber. D. Chem. Ges.*, 1885, 2234.

Benzin—Filtration of its Solutions.—Mr. A. Gawalowski communicates a useful expedient for causing benzin solutions to pass readily through filters previously moistened with aqueous liquids. He is often in the habit of making soap-analyses, and in such cases decomposes the soap with sulphuric acid, transfers the separated fatty acids upon a filter, and washes with water. The filtrate and washings are freed from any retained fatty acids by shaking with petroleum ether, and this ether is then used to dissolve the fatty acids upon the filter [the ethereal solution being finally evaporated and dried]. In order to be able to pass the petroleum ether solution through the filter, he has hitherto been compelled to dry the filter for many hours before it would permit the ether to run through. He has now found that by pouring a little absolute alcohol upon the edges of the filter, the latter is so thoroughly freed from the absorbed water, that it will immediately permit the benzin solution to run through, almost in a continuous stream, thereby shortening the time most considerably.—*Amer. Drugg.*, Aug. 1885, 147; from *Chem. tech. Central-Anz.*, No. 29.

Benzin—Fatal Case of Poisoning.—It is stated in "*Pharm. Rundschau*" (xii., 110) that an adult took 12–13 gms. of benzin (benzol?) in mistake for brandy. Ten or fifteen minutes after taking it the patient became insensible, and died 17½ hours afterward from asphyxia.

Paraffin—Use in Depriving Alcohol of Fusel Oil.—Paraffin dissolves in ether and ethereal oils, but not in alcohol. Coltelloni takes advantage of this in distilling alcohol. The vapors are passed through molten paraffin before condensing, which takes up the fusel oil, and pure alcohol condenses.—*Pharm. Rundschau*, xii, p. 131.

Paraffin—Use in Substance for Stoppering Bottles containing Syrups and Saccharine Juices, which see under "Pharmacy."

Paraffin—Value as an Excipient for Deoxidizable Substances.—Mr. Geo. Smith communicates some experiments made to determine the availability of paraffin as an excipient for pills of easily deoxidizable substances. His experiments were made with

Martindale's Mass, which appears to be composed of paraffin wax, 1; white vaseline, 2, and washed kaolin, 3 parts. The conclusions drawn by the author from this and former investigations are that "Martindale's Mass" may be pronounced perfect as an excipient for *silver salts*, of which *nitrate of silver* may be cited as a type. Practically it can be said to answer its purpose for *permanganate of potassium*, particularly if the pills are recently dispensed with a minimum quantity of the excipient. With the unstable *chlorine compound of gold* the excipient fails conspicuously, though it may possibly be made available even here by decreasing the quantity of excipient.—Pharm. Jour. and Trans, May 15, 1886, 957, 958.

Naphthalinum—Characters.—The Pharmacopœia commission of the German Apothecaries' Association defines the characters of naphthalin. It occurs in colorless, glistening, transparent crystalline plate, having a penetrant odor reminding of coal tar, and a burning, aromatic taste, volatile at ordinary temperature, readily with the vapor of water, melting at 80° C., boiling at 218° and burning with a bright smoky flame. It is readily dissolved by ether, chloroform and bisulphide of carbon, and when heated, also in alcohol, fixed oils, and liquid paraffin; but water dissolves it very sparingly. For internal use it should be purified by re-crystallization from alcohol. The same commission define the characters of

Naphtholum (Iso- or β Naphthol).—This occurs in colorless, silky, glistening leaflets, or as a white crystalline powder, having a faint phenol-like odor and a burning, acrid, though not persistent taste. It melts at 123° and boils at 286° C.; is soluble in about 1,000 parts of cold and in 75 parts boiling water; readily soluble in alcohol, ether, benzol, chloroform, oils and alkaline solutions. It should dissolve completely in 50 parts of ammonia water. Its aqueous solution, prepared with heat, should not give a violet color with ferric chloride. It should be completely volatilized when heated in platinum foil.—Arch. d. Pharm., July (2), 1885, 546.

Naphthalin—Purification.—Mr. Link observes that by repeatedly submitting commercial naphthalin to pressure in strong hydraulic presses and distilling, then treating with solution of soap at a temperature of about 85° C., which dissolves most of the naphthalin, and, on adding water and reducing the temperature to about 50° C., the naphthalin precipitates, the oily substances remain dissolved with the soap. By washing and redistilling, the author obtained almost chemically pure naphthalin in large snow-white flakes.—Pharm. Zeit. für Russland, xxv, p. 279.

Naphthalin—Antiseptic Value.—A writer in "L'Union Méd." (Dec. 12, 1885) observes that naphthalin is a good antiseptic, and when applied

to ulcers causes the rapid disappearance of any offensive odor. Being non-irritant, its application is painless; moreover, it induces rapid healing and cicatrization of the ulcers.—*Amer. Jour. Pharm.*, Feb. 1886, 93.

According to Dr. G. R. Fowler, a derivative of naphthalin,

Hydronaphthol, is a more efficacious antiseptic than carbolic acid. It crystallizes in silvery white or grayish laminæ, has a slight aromatic odor and taste, is not irritating or poisonous, does not volatilize at ordinary temperature, but sublimes at about 90° C., is soluble in about 1,000 parts of water, and dissolves freely in alcohol, ether, chloroform, glycerin, benzol and fixed oils. Its compounds with alkalies and alkaline earths are readily decomposed by carbonic acid. The saturated aqueous solution will perfectly preserve for an indefinite time animal tissues and fluids; when volatilized for purposes of fumigation the vapor of hydronaphthol has no obnoxious effect upon the organs of respiration, nor will it injure textile fabrics. The powder mixed with 50 times its weight of magnesium carbonate, fuller's earth or kaolin may be dusted on wounds and drainage tubes; and absorbent gauze, cotton, jute, wood flour, sawdust, etc., may be impregnated with it by means of the alcoholic or benzol solution.

The 10 per cent. alcoholic solution perfectly sterilizes, and sufficiently hardens and preserves catgut.—*Amer. Jour. Pharm.*, Feb. 1886, 93; from *N. Y. Med. Jour.*, Oct. 3, 1885.

Naphthol—*A Delicate Reagent for Chlorine and for Nitrogen Acids*, which see under "Inorganic Chemistry."

Naphthol—*Antiseptic Value*.—Mr. W. J. Rigney states that he has recently obtained results with naphthol which would place it among the most efficient antiseptics. The naphthol experimented with was first purified and crystallized, and in this state it is an odorless white powder with a hot peppery taste. To 500 cc. of beef-tea was added 0.3 gm. of naphthol and allowed to stand for a period of 30 days, when it was found to have retained its characteristic odor as fresh as when first prepared. A beef lung which had already commenced to putrefy was immersed in a solution containing 1 part of naphthol to 500 parts of water; the solution at first became red owing to the particles of blood which adhered to the lung; it soon grew turbid and finally settled as a dull gray precipitate, leaving the solution clear. The lung was withdrawn, and all smell of putrefaction was found to have been removed; it was then returned to the solution, and after standing some time it was found to have an odor resembling that of beef-tea, and has remained thus for four months.—*Amer. Drugg.*, Aug. 1885, 144.

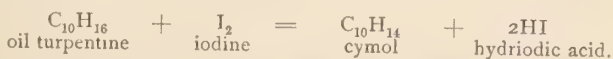
Hydronaphthol—*Identity with β Naphthol*.—Mr. E. Merck draws attention to the fact that the so-called "hydronaphthol," which has recently been introduced into Europe on account of its American reputation as an excellent antiseptic, is nothing more nor less than the well known β

naphthol. Experiments made by the author prove the complete identity of the two substances.—Pharm. Rundschau, June 1886, 134, 135.

Anthracene—*Use for the Construction of a Novel Filter*, which see under “Pharmacy.”

Terebene, Terpene, Terpin, and Allied Bodies.—In view of the confusion existing, regarding the identity and nature of these bodies, both among the authors who have studied them and pharmaceutical and medical writers in using and prescribing them, one of the editors of “Amer. Drugg.” (1886, 63–64) reviews the history of the different *terpenes*, in the hope that it may serve to identify the particular terebene or terpenes that may come under notice, or may be demanded. The importance of the subject justifies the following extensive abstract of the author’s review for this report. The author remarks that among the organic hydrocarbons there is a series distinguished by the generic name:

Terpenes, which have the composition $C_{10}H_{16}$ or a multiple of this, and are sometimes also called camphenes. These may be considered as addition-products of hydrocarbons of the aromatic or benzol series, the close relationship being, among other proofs, shown by the fact that, when iodine is made to act upon oil of turpentine, the products are, almost quantitatively, cymol and hydriodic acid:



Terpenes have the faculty of uniting directly, that is, of forming addition products—with halogen acids as well as with water. They are also very easily polymerized, that is, condensed to multiple molecules, each containing two or more of the simple molecule $C_{10}H_{16}$ —either by heat alone (under pressure), or by the intervention of certain reagents, such as sulphuric acid, boron fluoride, etc.

The following scheme exhibits the more important members of this group and their derivatives, together with their relations:

Terpenes: $C_{10}H_{16}$ or $(C_{10}H_{16})_x$

A. *Natural Terpene*.

terebenthene }
australene } from oil of turpentine, and others.

B. *Artificial Terpenes*.

camphene (and terebene) colophene, (and terpenes from many volatile oils: cajeputene, cedrene, menthene, etc., etc.).

C. *Derivatives of French Oil of Turpentine (terebenthene) only*.
terpene hydrate.

D. *Derivatives of any Variety of Oil of Turpentine*.

terpene hydrochloride, terpin hydrate, terpin, terpinol, terpinene, terpilene (terpinylene).

1. *Oil of Turpentine*, the most abundant source of terpenes, is obtained by the distillation of turpentine, the naturally exuding balsam or oleo-resin of coniferous trees.

There are two chief varieties:

a. The *lævogyre*—turning the plane of polarized light to the left.

Of this kind is the French oil of turpentine, obtained from *Pinus maritima*, Poiret (= *Pinus Pinaster*, Solander). The boiling point of this oil is 155° C. (311° F.), and the spec. grav. 0.8749 at 0° C. (32° F.).

The oil of turpentine distilled from Venice turpentine, the product of *Larix europæa* D. C., and that obtained from Canada balsam, derived from *Abies balsamea*, Marshall, and allied species of *Abies*, are likewise lævogyre. But the latter is not a commercial product, and the former is not common.

b. The *dextrogyre*—turning the ray of polarized light to the right. Of this kind is all that is produced in the United States, from *Pinus Tæda* L., and *Pinus australis*, Michaux (= *Pinus palustris*, Miller). Also all that is distilled in Russia, Sweden, and elsewhere from *Pinus silvestris* L. There are also varieties of oil of turpentine which are compounds of the two preceding.

Most Russian oil of turpentine, which is chiefly derived from *Pinus silvestris*, L., and *Pinus Ledebourii*, Endlicher, (*Larix sibirica*, Ledebour) is composed of a very large proportion of dextrogyre (boiling at ab. 171° C.= 339.8° F.) mixed with a little lævogyre (boiling at 157° C.= 314.6° F.) oil of turpentine. It is not known what may be the cause of this. But it appears probable that it is due to the simultaneous presence of turpentines derived from different species of *Pinus*, when the oil is distilled off. A correct knowledge of this question can only be obtained by examining absolutely authentic samples of the several turpentines.

Scotland also produces some oil of turpentine, composed of about $\frac{1}{3}$ of a dextrogyre and $\frac{2}{3}$ of a lævogyre portion. The former boils at 156° – 159° C. (312.8° – 318.2° F.); the latter at 171° C. (339.8° F.).

So-called German oil of turpentine is almost exclusively produced in Russia, though small quantities are made here and there in Germany from *Pinus silvestris*, L., *Pinus nigra*, Link, *P. rotundata*, Link, and *Pinus Abies*, L. In Austria, some oil of turpentine is also made from *Pinus Laricio*, Poiret, but it is not known to us what the optical properties of this oil are.

From any of the above oils of turpentine, which in their crude state are contaminated with resin, organic acids and other impurities, the hydrocarbon or terpene may be obtained in a pure state by the following process, in which neither the heat nor the reagents employed are energetic enough to modify the nature of the terpene.

The crude oil of turpentine is first washed with a dilute solution of caustic soda, until it ceases to have an acid reaction, and then distilled in

vacuo. By selecting the proper fraction of the distillate, the pure terpene may be obtained.

As there are oils of turpentine of opposite optical properties, so there are two kinds of terpenes, namely:

a. Terebenthene (or tercbentene) which is lævogyre, and only obtained from French and other left-polarizing oil. The terebenthene from French oil of turpentine boils at 156° C. (312.8° F.) and has a spec. grav. of 0.8767 at 0° C. (32° F.). The corresponding figures of other left-polarizing terebenthenes are not certain.

b. Australene, which is dextrogyre, and obtained from American and other right-polarizing oil. The boiling point and specific gravity of this appear to vary somewhat according to the source.

2. *Terebene*.—It was St. Claire Deville who first studied the terebene produced by the action of sulphuric acid upon oil of turpentine. J. Riban subsequently found that this "terebene" was not a pure substance (*Comptes Rend.*, vol. 79, 1547; 77, 483). The latter chemist treated oil of turpentine, boiling at 156° – 160° C., with one-twentieth of its weight of sulphuric acid, avoiding the development of too much heat, and after twenty-four hours he distilled the supernatant liquid, previously washed with soda solution, and dried. The fraction boiling below 250° C. (482° F.) was treated five to eight times in the same manner. At each distillation there was formed sulphurous acid and water. The product finally obtained was optically inactive, and could be split by fractional distillation, into the following substances:

1. Terebene, boiling at 155° – 156° C.
2. Cymol, boiling at 174° – 176° C.
3. A camphor-like body, boiling at about 200° C., and melting at 169° C.
4. Colophene, boiling at 318° – 320° C.
5. Higher boiling bodies.

That portion of the original crude substance which boiled between 155° and 186° C. was treated with metallic sodium before being subjected to fractional distillation.

The "pure terebene" thus obtained by Riban was a colorless, mobile liquid, not becoming solid when cooled to 27° C. (81° F.), and possessing a faint odor.

Riban found the specific gravity of his terebene to be 0.877 at 0° C. (32° F.), and 0.860 at 20° C. (68° F.) Orłowsky found it to be 0.8624 at 15° C. (59° F.), which agrees with the figures of Riban.

Terebene, in the form in which it is prepared by manufacturers and employed in medicine, nearly corresponds, in physical and chemical properties, with the terebene of Riban just described. In practice, it is not considered necessary to be very particular about the exact boiling-point of the fraction collected. The chief requirement is, that it shall be optically inactive, and free from those portions which boil above 160° C.

A few authorities still recognize the existence of terebene as a chemical individual, while others prefer to regard it merely as optically inactive camphene. Terebene differs from cymol only by having two more atoms of hydrogen, and is closely related to it, and through it to the benzol group, for cymol itself is now recognized as propyl-toluol.

3. *Terpene Hydrate*: $C_{10}H_{16} \cdot H_2O$.

This substance is derived from left polarizing (French, etc.) oil of turpentine. It may be prepared in the following manner:

Mix 2 parts of French oil of turpentine with 3 parts of 90 per cent. alcohol and 1 part of sulphuric acid of spec. gr. 1.640, shake frequently at first, then set aside for twelve days, separate the terpene and rectify it, preserving the portion boiling between 218° – 220° C. (424 – 428° F.) It is an oily liquid, of the spec. grav. 0.9201 at 18° C. (64.4° F.), insoluble in water, but soluble in a mixture of 2 parts of 90 per cent. alcohol and 1 part of sulphuric acid (sp. gr. 1.640).

PRODUCTS OBTAINABLE FROM ANY KIND OF OIL OF TURPENTINE.

4. *Terpene Hydrochlorides*.—When hydrochloric acid gas is passed through any kind of oil of turpentine, best after its dilution with benzol or carbon disulphide, a solid substance *terpene (mono-) hydrochloride*, $C_{10}O_{16} \cdot HCl$ is formed which is also known as “artificial camphor.” It is solid, resembles camphor in appearance and odor, is insoluble in water, easily soluble in alcohol, but cannot be sublimed without alteration.

On treating oil of turpentine with strong hydrochloric acid, also on similarly treating terpin hydrate (see below), or terpinol (see below), or terpene hydrate (see above) *dihydrochloride of terpene* $C_{10}H_{16} \cdot 2HCl$ is formed. This forms rhombic crystals, melting at 48° C. (118.4 F.).

Other hydrochlorides exist, but are not of special interest here.

5. *Terpin Hydrate*: $C_{10}H_{16} (H_2O)_2 \cdot H_2O$.

This may be prepared from any kind of oil of turpentine. Of pure terpenes only those yield this substance which have the lower boiling points. Terpenes boiling at about 176° C. (348.8 F.) and over, yield none.

This substance, which must neither be confounded in name with terpene hydrate, nor in appearance with terpene dihydrochloride, or other similar bodies, is formed in various ways. It is slowly produced when oil of turpentine remains for some time in contact with water. More rapidly, by exposing 8 parts of oil of turpentine, 2 parts of nitric acid (spec. gr. 1.250), and 1 part of alcohol of 80 per cent., to the air in a shallow vessel, frequently agitating at first. Or by mixing in a flask 1 volume of nitric acid (spec. gr. 1.400), 1 volume of wood-spirit, and $2\frac{1}{2}$ volumes of oil of turpentine, agitating frequently during two days, then pouring into an open dish, and adding small quantities of wood-spirit every other day.

Terpin hydrate crystallizes in large, transparent, rhombic crystals, which lose 1 mol. of water at 100° C. (212° F.) and becomes *terpin* (see the next following). Mere exposure over sulphuric acid will also drive out the third molecule of water. The crystals are inodorous and tasteless, soluble in 200 parts of cold and 22 parts of boiling water, in about 7 parts of 85 % alcohol, and easily also in ether. From hot glacial acetic acid they may be obtained of great size and beauty. Crystals of this compound, of considerable size, are sometimes met with in trunks of pine trees.

This *terpin hydrate* has recently been recommended by Lepine as "the best expectorant in existence."

6. *Terpin*: $C_{10}H_{16}(H_2O)_2$.

When terpin hydrate has been deprived of the third molecule of water, it becomes "anhydrous" terpin: $C_{10}H_{20}O_2$. This melts at 103° C. (217.4° F.), subliming in slender needles, and boils at 250° C. (482° F.). It is very hygroscopic, and changes to terpin hydrate by mere exposure to moist air.

When treated with anhydrous phosphoric acid (P_2O_5) it is converted into "terebene" and colophene.

The name *terpin* has been used by some authors (f. i. Flückiger, *Phar. Chemie.*, 320 sqq.) as denoting *terpin hydrate*: $C_{10}H_{16}(H_2O)_3$. It is better, however, to apply the two terms as explained above.

7. *Terpinene*. When terpin is treated with moderately strong sulphuric acid, there results *terpinene*, boiling at 176.5 – 181.5° C. (349 – 358° F.), and optically inactive (Laubenheimer).

8. *Terpinol*: $(C_{10}H_{16})_2H_2O$.

If an aqueous solution of terpin be heated with a small quantity of hydrochloric acid, *terpinol* is produced, which is an oily liquid, having an odor resembling that of hyacinths, boils at 168° C. (234.4° F.), and has the spec. gr. 0.852.

The same substance may also be produced by boiling terpene dihydrochloride with water or with alcoholic potassa. Or, by distilling terpin with moderately dilute sulphuric acid.

9. *Terpilene* or *Terpinylene*: $C_{10}H_{16}$. This body is formed by warming terpene dihydrochloride (of the melting point 48° C. = 119° F.) by itself. Or, by boiling terpin with a mixture of 1 vol. of sulphuric acid and 2 vol. of water, and fractionating the product. It boils at 176 – 178° C. (349 – 352° F.), and has the spec. grav. 0.8526 at 15° C.

In conclusion the reviewer gives the working process of Dr. Hirsch for

Medicinal Terebene.—Take of oil of turpentine 1,000 p., concentrated sulphuric acid, solution of soda, of each q. s. Mix the oil of turpentine with 25 parts of sulphuric acid, in *one* portion, and agitate thoroughly. When the heat generated thereby has become moderated to 70° C. (158° F.), add another portion of 25 parts sulphuric acid. Repeat this in suit-

able intervals, with three more portions, each of 25 parts of the acid, taking care that the mixture do not acquire too high a temperature (if not properly watched, it might rise to 130° C. = 266° F., and even higher). Shake the mixture for some time, in brief intervals, then set it aside for 24 hours. Remove the oil from the acid, wash the former with enough solution of soda to remove all trace of acidity, then transfer the oil to a retort, and pass a brisk current of steam through it as long as any oil passes over. The distillate is crude terebene, and should be optically inactive (which is to be ascertained by means of a polariscope). If it is not yet inactive, but turns the plane of polarized light either to the right or to the left [the latter would happen only if French or other left-polarizing oil had been originally used], treat it again with sulphuric acid, in proportion of 5 parts of acid to 100 of oil, and again distil with a current of steam. From the optically inactive product finally obtained, which is a mixture of terebene and other hydrocarbons, the real terebene is separated by repeated fractional distillation, all portions boiling above 160° C. (320° F.) being rejected. When perfectly pure, terebene is a white crystalline mass. In the form in which it is used as an antiseptic, it appears as a clear, colorless, optically inactive liquid, having a pleasant odor resembling that of thyme, the spec. grav. 0.860, and boiling at about 156° C. (313° F.).

Terpin and Terpinol—*Medicinal Value, etc.*—Prof. Dujardin-Beaumetz speaks highly of these substances for the treatment of catarrh of the lungs. In view of the confusion respecting the two substances, it is necessary to give the author's definition of the respective bodies. He says that when turpentine is distilled in presence of an alkali, there is obtained a special hydrocarbon having for formula $C_{10}H_{16}$; this is *terebinthene*, which undergoes hydration, and thereupon furnishes a white, solid, crystalline body, which is the *bihydrate of terebinthene*, or

Terpin. This terpin, in presence of an acid, such as sulphuric or hydrochloric, is transformed into an oily body, to which has been given the name of

Terpinol. Terpinol is an oily body, which gives forth a very strong odor of tuberose, and especially of gardenia. The author has employed it in form of capsules, each containing 10 centigrams, from 6, 8, 10 or 12 being given per day. It may also be given in pill form (see under "Pharmacy"). The author prefers terpinol to terpin, the latter having been first employed by Prof. Lepine, of Lyons, and, as a result of experiments on man and animals, he found that this body might be with advantage substituted for turpentine, and that it acted as expectorant and diuretic; his dose of terpin is twenty to sixty centigrams (three to ten grains). Terpin, however, presents a real inconvenience in its slight solubility, requiring, as it does, 200 parts of cold water to dissolve one part

of this substance; therefore, it is necessary to have recourse to alcohol in order to obtain active solutions; which is a drawback when one desires to prescribe it for diuretic purposes. Prof. Dujardin-Beaumetz has given terpin in much larger doses than M. Lepine; having administered one, two, and even three grams a day without obtaining any well-marked diuretic effect. He has, therefore, abandoned terpin and substituted terpinol, for which he has noted the following effects: (1) The rapid elimination by the respiratory passages of terpinol, which long imparts its special odor to the breath; (2) Its feeble elimination by the urine, which also gives forth the odor of terpinol, though much less markedly than the breath.—*Amer. Jour. Pharm.*, March 1886, 143, 144; from *Med. News*, Feb 20, 1886.

Terebenes—*Characters*, etc.—Mr. O. Wallach has made a comprehensive study of certain terebenes, of which the following is a brief summary:

Borneol.—Pure borneol, prepared by the action of sodium on camphor, melts at $206-207^{\circ}$, not at 198° as generally stated. This compound behaves like a saturated secondary alcohol, but it has the property of uniting with bromine and hydrogen bromide, etc., to form unstable additive products. For example, when bromine is added to a solution of borneol in light petroleum, a crystalline precipitate is deposited, which consists chiefly of *borneol bromide*, $C_{10}H_{18}O.Br_2$, mixed with a small quantity of $(C_{10}H_{18}O)_2Br_2$. Cineol, like borneol, unites with bromine in two different proportions, forming compounds which have the same composition as the borneol bromides. When borneol bromide is covered with light petroleum and left for some time in a closed vessel, decomposition ensues, resulting in the formation of borneol and borneol hydrobromide, $(C_{10}H_{18}O)_2.HBr$. The same compound is obtained as a white, crystalline powder by the action of hydrogen bromide on a solution of borneol in light petroleum. It is decomposed by water and alcohol.

The *hydriodide*, $(C_{10}H_{18}O)_2.HI$, is a white, crystalline compound, which decomposes spontaneously.

Bornyl chloride, $C_{10}H_{17}Cl$, is easily prepared by adding borneol to a mixture of phosphorus pentachloride and light petroleum. The action is finished in half an hour. The crude product is poured into water, and repeatedly washed. Bornyl chloride is not identical with pinene hydrochloride. It is readily converted into camphene by heating with aniline. Camphene is decomposed by dehydrating agents, such as zinc chloride and strong sulphuric acid, or by the action of heat alone. In each case the decomposition products are liquid. Monobromocamphene is obtained as an oily liquid when bromine is added to a solution of camphene in alcohol and ether.

Camphene is formed by the action of dehydrating agents on borneol,

but the hydrocarbon cannot be isolated (except when potassium pyrosulphate is the dehydrating agent) as it is decomposed by zinc chloride or phosphoric anhydride or strong sulphuric acid. The so called

Borneen, which Pelouze, and Kachler and Oppenheim obtained by the action of phosphoric anhydride on borneol, is a mixture of the decomposition products of camphene.

The author confirms Tilden's statement (see Proceedings, 1880, 261), that Russian and Swedish oil of turpentine contain the same constituents, namely, australene, sylvestrene, and dipentene. The hydrocarbon obtained by decomposing sylvestrene chloride with aniline closely resembles sylvestrene, but the identity of the bodies is not proved. The hydrocarbons yield a chloride melting at 72° , and a liquid bromide.

"*Terpinol*" described by Wiggers (Annalen, lvii. 252), and by List (Ibid., lxvii. 367), does not exist.

Terpin hydrate, $C_{10}H_{20}O_2 \cdot H_2O$, melts at 117° . It is a saturated compound, and is decomposed by boiling with acids or dehydrating agents, yielding terpineol, $C_{10}H_{16}O$, and other products. When a mixture of 1 part of sulphuric acid and 2 of water are used, terpineol, terpinene, $C_{10}H_{16}$, and terpinolene are formed. When very dilute sulphuric acid is used, the chief product is terpinene. Dilute phosphoric acid and glacial acetic acid on the other hand yield terpineol as the principal product. Terpin hydrate is almost completely converted into dipentene by prolonged treatment with potassium pyrosulphate.

Terpineol, $C_{10}H_{16}OH$, is a non-saturated monatomic alcohol. It is a thick liquid, boiling at 215° , and is sparingly soluble in water. It unites with bromine to form an unstable bromide.

Dipentene tetrabromide, melting at 124° , is formed by the action of an excess of bromine on terpineol. The hydroxyl in terpineol is easily replaced by chlorine or iodine, yielding for example the chloride, $C_{10}H_{15}Cl_2$, melting at 50° , and the iodide melting at 77° . Terpineol unites with carbanil, forming phenylterpinylurethane, which crystallizes in white needles melting at 110° . Boiling with dilute acids, or treatment with dehydrating agents, converts terpineol into terpene or dipentene; but if terpineol is left at the ordinary temperature in contact with dilute sulphuric or hydrochloric acid, it unites with water, forming terpin hydrate, $C_{10}H_{20}O_2 \cdot H_2O$.

Terpin has the same boiling point as dipentene, but the two compounds are not identical, as the former yields a liquid bromine-derivative. Terpin is formed by the inversion of pinene with alcoholic sulphuric acid.

Terpinolene has not yet been obtained in a pure state. It boils between 185° and 190° , and yields an unstable tetrabromide, crystallizing in monoclinic plates.—Amer. Jour. Phar., March 1886, 145-147; Jour. Chem. Soc., 1886, 70; Annalen, ccxxx, 225-272.

Essential Oils—Examination.—For the examination of certain essential oils, chiefly with a view to distinguish the “natural” products from imitations, Dr. H. Hager employs a 10 per cent. aqueous solution of mercuric nitrate. Four drops of the essential oil are dissolved in 2 cc. of alcohol, and two to three drops of the nitrate solution added. No reduction occurs with the essential oils of cherry laurel or bitter almonds. The greater number of oils, however, have a reducing action on the nitrate, and their presence in admixtures with the above is indicated by the formation of a grey precipitate of metallic mercury. The artificial oil of bitter almond water also precipitates the solution, and is thus distinguished from the natural. The following oils, viz., ol. cassiæ cinn., succini, petræ, linanthracis, vinæ, vitis viniferæ—do not readily reduce the nitrate, but their presence in bitter almond oil is indicated by the opalescence occasioned by diluting with 6 parts of alcohol (sp. gr. 0.895). Mustard oil treated under the above conditions gives a slight reduction; the artificial products sold under that name were found, on the other hand, to reduce rapidly, giving a dark-grey precipitate. *Phar. Jour. and Trans.*, Nov. 14, 1885, 414; *Jour. Soc. Chem. Industry*, Oct. 1885.

Volatile Oils—Examination of Commercial Samples.—Mr. Adolph E. Melcher has examined three samples each of the oils of *lemon*, *peppermint*, *bergamot*, *wintergreen* and *sassafras*, one set of samples from New York, the others from dealers in Ohio, and found them all to conform well with the requirements of the U. S. Pharm. The author gives some details of his experiments, which may be consulted in *Proc. Mich. State Pharm. Assoc.*, 1885, 160–163.

Oil of Turpentine—Modification resembling Oil of Lemon.—Messrs. Bouchardat and Lapont, by treating oil of turpentine carefully rectified at 155° to 157° C. and dissolved in glacial acetic acid with chromic acid dissolved in the same solvent, have obtained a modification of the oil closely resembling in several particulars oil of lemon. To this they have given the name of

Levogyre Terpilene. Its formula is $C_{10}H_{16}$, and it agrees in boiling point and its principal character with oil of lemon, which its odor resembles. It is very oxidizable in air, and by treatment with gaseous hydrochloric acid forms a dichlorhydrate. Another body, which with the above forms the chief result of the action of chromic acid on the oil of turpentine, yields under similar treatment a monohydrochlorate that behaves like a mixture of hydrochlorate of terebenthene and camphene. —*Pharm. Jour. and Trans.*, Jan. 30, 1886, 642; *Compt. rend.*, cii., 51.

Russian Oil of Turpentine—Variability in Optical Character of Different Samples.—Mr. C. T. Kingzett confirms a previous statement of Dr. Armstrong as to the remarkable divergences in the optical character of different samples of Russian oil of turpentine, and states that the diver-

gences extended also to specific gravity and susceptibility to oxidation by air. These differences he attributes to the fact that not only in Russian turpentine derived from more than one species of *Pinus*, but that there is reason to believe that different parts of the trees, which are distilled together in varying proportions, do not yield a turpentine absolutely uniform in composition. Moreover, the oil of turpentine is contaminated with products of destructive distillation, including various hydrocarbons, creasote, tar, etc. Probably, therefore, the only method of obtaining an absolutely uniform turpentine oil, irrespective of kind, would consist in the separate distillation of one particular part of trees of a single species.—*Pharm. Jour. and Trans.*, Jan. 30, 1886, 642.

Resins—Characters of Distinction of those from Pinus Sylvestris and Pinus excelsa, which see under “*Materia Medica*.”

Resin—Quantitative Valuation in Soaps, which see under “*Pharmacy*.”

Abietinic Acid and Pimaric Acid—Characters as Found in Certain Species of the Abietinæ, which see under “*Materia Medica*.”

Rosolene—Antiseptic Properties, etc.—According to Mr. Seriant, rosolene—a product of the dry distillation of colophony—possesses remarkable antiseptic, tonic and cicatrizing properties, and when applied directly to wounds and suppurating surfaces controls the suppuration and promotes a prompt and normal cicatrization. Besides containing special antiseptic properties, it is applicable to the same purposes as ordinary fats, oils and paraffins, and has been already successfully employed, on account of its non-oxidizable properties, for the extraction of the perfume of flowers. Crude rosolene is that portion of the dry distillation of colophony that passes over at 280° C., and presents the appearance of a dark green or brown oil, having a tarry odor. But after redistillation with slightly alkaline water and treatment with finely powdered litharge, it resembles poppy-seed or sweet almond oil, being yellow or pale yellow, having a slight peculiar taste, scarcely any odor, and a sp. gr. of 0.950. It is not saponifiable, insoluble in water and alcohol, but soluble in ether, volatile oils and in bisulphide of carbon. It mixes perfectly in all proportions of fixed oils, is always neutral, and does not turn rancid.—*Pharm. Jour. and Trans.*, Nov. 28, 1885, 446; *Compt. rend.*, ci., 953.

Oil of Lemon—Chemical Constitution.—Messrs. G. Bouchardat and J. Lafont have carefully fractionated essence of lemon and examined the products obtained by the action of dry hydrogen chloride on the different fractions. In most cases distillation was conducted under reduced pressure. The results lead to the conclusion that essence of lemon is a highly complex substance consisting mainly of hydrocarbons of the composition $C_{10}H_{16}$, and a little cymene. The most abundant of the $C_{10}H_{16}$ hydrocarbons is a citrene, which boils at about 178° , has a rotary power higher than $+105^{\circ}$, and yields directly a solid inactive dihydrochloride.

The essence also contains small quantities of several terebenthenes, which begin to boil below 162° , and yield monohydrochlorides differing from one another in their rotatory powers.—*Amer. Jour. Pharm.*, Febr. 1886, 93; from *Compt. rend.*, ci., 383-385.

Oil of Lemon—Detection of the Presence of Oil of Turpentine.—According to Mr. G. Heppe, an adulteration of oil of lemon with oil of turpentine may be detected by slowly heating the oil in a dry test tube with a small piece of copper butyrate to about 170° C., taking care that the temperature does not exceed 180° . The copper salt will dissolve in pure lemon oil with a green color, while in the presence of oil of turpentine a yellow, turbid mixture is obtained, reddish-yellow cuprous oxide being separated. The test seems also to be applicable for the oils of bergamot and orange peel.—*Archiv d. Phar.*, 1885, 349.

Japanese Camphor Oil—Presence of Camphor.—Referring to the paper of Mr. Peter MacEwan on "Natural Camphor Oils" (see Proceedings 1885, 259), in which the opinion is expressed that "the camphor oil of Japan has the camphor removed from it before it is sent to this country," Mr. John Moss communicates the results of his experience with rather large quantities of this oil, which lead him to doubt the conclusion arrived at by Mr. MacEwan. Mr. Moss's experience points to very great diversity in the appearance and composition of the natural camphor oil of Japan. He has seen specimens of many shades of color, from water white to deep black, the more commonly occurring here being a pale straw yellow when seen in a Winchester quart. The specific gravity varies from 0.898 in the colorless oil to 0.990 in the very dark, and no two consecutive tins have the same specific gravity. One tin, which was opened in the cool weather of early spring, contained two pounds of the small grains, which are familiar as crude camphor; other tins were noticed containing small quantities of deposited camphor, but not during the hot summer weather. Some experimental data are given by the author which prove very conclusively that some specimens of the natural camphor oil of Japan contain an abundance of camphor. All of this points to a want of care in the preparation of the oil, and the author concludes that if Formosa and Borneo camphor oils are prepared with no greater care than the Japanese camphor oil, observations made on imported specimens are of little value for reference.—*Yearbook of Pharm.*, 1885, 425 to 430.

Japanese Camphor Oil—Composition.—Mr. Kikorokuro Yoshida has communicated to the Chemical Society of Tokio a very interesting paper on Japanese camphor oil, which throws further light on its composition, and very opportunely supplements the papers of Mr. Moss (see above), and of Mr. MacEwan (see Proceedings, 1885). Mr. Yoshida examined two specimens of the oil, the one five years old, the other more recent

but of uncertain age. By distilling the five-year-old oil into sixty-five fractions, the oil was finally separated into five portions:

1. Boiling below 145° C.	0.2 per cent.
2. A hydrocarbon boiling at 156° C.	7.0 "
3. " " " " 172° to 173° C.	20.0 "
4. Camphor, boiling point 205° C.	22.8 "
5. An oxygenated oil, boiling at 212° to 213° C.	50.0 "

Fraction 1 consisted of an oily hydrocarbon, but was too small in quantity for examination. Fraction 2 was found to be *terebinthene* ($C_{10}H_{16}$), identical chemically, but differing physically, from that yielded by turpentine. Fraction 3 is a terpene having a pleasant lemon odor, and probably identical with the *citrene* of lemon oil. Fraction 4 was camphor, pure and simple. Fraction 5 is the most interesting, since it is composed of a new body to which the formation of camphor in the oil by aging is due. The author names the new body provisionally

Camphorogenol [or camphor hydrate, $(C_{10}H_{16}O, H_2O)_1$] It is a colorless, heavy oil, of sp. gr. 0.9794 at 20° C., has a pleasant camphoraceous odor, but milder than that of camphor. It is soluble in alcohol, ether, and bisulphide of carbon, but insoluble in water. Warmed in the dilute nitric acid (1 to 20 of water) it yields a large quantity of camphor, and a yellow oil, from which more camphor may be obtained by freezing. Chromic acid has a similar effect. By the action of sodium on the alcoholic solution of camphorogenol, *Camphol* (borneol) is produced. The body, therefore, forms a connecting link between camphor and borneol.—Pharm. Jour. and Trans., Nov. 21, 1885, 427-428.

Camphor Oil—Commercial Uses.—Mr. Charles A. Heinitsh discusses the legitimate uses of the camphor oil of commerce, as well as its abuses. He believes it to be largely used as an adulterant of other essential oils. The quantities imported are so largely in excess of the legitimate uses of the oil that the author seems justified in the view he holds.—Proc. Penn. Pharm. Assoc., 1886, 165-168.

Camphor—Poisonous Dose.—Dr. I. P. Ryan reports the case of a lady, who suffered from poisonous symptoms on eating a piece of camphor, which weighed about 20 grains. She began eating the camphor at two o'clock, passed through a condition resembling intoxication, and at three was nearly unconscious and in a semi-collapsed state. She was treated with 20 grains of zinc sulphate, which was followed by free vomiting, and afterwards with ammonia and strong coffee. The interest of the case lies in the smallness of the amount which could have been absorbed, and which is considerably under the amounts given for prescription in Wood and Ringer.—Med. Chronicle, Jan. 1886; from Austral. Med. Jour.

Anemone Camphor.—*Occurrence in Ranunculaceous Plants and Characters*.—See *Ranunculaceæ*, under “*Materia Medica*.”

Oil of Peppermint.—*Resinification*.—Mr. Carl Schmidt makes some practical observations respecting the resinification of oil of peppermint by age. Such oil forms a turbid solution in alcohol, which becomes clear after several weeks under ordinary conditions; but a clear solution may be obtained if the liquid is agitated strongly for about half an hour. The resin then separates on the sides of the bottles, and the clear liquid may be simply decanted.—*Pharm. Rundschau*, 1886, 5.

Oil of Peppermint.—*Test for Removal of Pimenthol*.—It being stated that large quantities of oil of peppermint are now on the market from which the pimenthol has been removed. Messrs. Fritsche Bros. recommend the following method for the detection of the fraud. A test tube is partially filled with the suspected oil, and is placed in a freezing mixture of snow and salt for ten or fifteen minutes. At the end of that time, if the oil has not been tampered with, it will have become cloudy, thick, or of a jelly-like consistence, and if then four or five small crystals of menthol be added and the tube replaced in the freezing mixture, the oil will after a short time form a solid mass of crystals. If limpid or partially so, it indicates adulteration or removal of menthol.—*Pharm. Jour. and Trans.*, Feb. 27, 1886, 723.

Menthol.—*Properties*.—Elmer B. Kyle, Ph. G., mentions the following among the properties of menthol. When thrown upon water, currents are produced to and from the dissolving crystals, similar to the motions observed under the same condition with camphor. Menthol liquefies with chloral, thymol and camphor, and this action is particularly noticeable with thymol, crystals of the two substances, placed in contact, being in a few minutes transformed into a thick oily liquid. On gently heating a mixture of one drachm of the aqueous solution of menthol with half a drachm of a solution of one grain iodine and five grains potassium iodide in two drachms of water with a small quantity of potassa solution, the characteristic odor of iodoform is observed. The aqueous solution is not disturbed by ferric chloride or bromine water, but yields a slight turbidity with chlorine water. One grain of menthol yields, with 120 drops of sulphuric acid, a brownish-red liquid of a very disagreeable odor, and on the addition of a little potassium bichromate, becomes chrome-green, the color remaining unaltered for several weeks. Menthol slightly warmed with nitric acid yields a thick, wine-colored, oily liquid, and at a higher heat, red fumes are given off; on neutralizing now with ammonia, a precipitate was observed, which was soluble in alcohol, the solution, when evaporated yielding an indistinctly crystalline mass.—*Amer. Jour. Phar.*, Sept. 1885, 439.

Menthol.—*Distinction of Japanese Menthol from Pimenthol*.—Wm. J.

Laval, Ph.G., examined two samples of Japanese menthol and one of pipmenthol, and found them to differ mainly in the fusing point, which for the latter was 40° C. and for the other two specimens 35° and 36.5° C. The specific gravity was .9002 and .9004, and for pipmenthol .9003. At 39° C. 1 gm. of alcohol dissolved 8.327 gm. of menthol, and 20 gm. of water took up .031 of menthol. This is insoluble in hydrochloric acid, not affected by alkalies, sparingly soluble in glycerin, somewhat soluble in warm acetic acid, decomposed on being heated with nitric acid, the mint odor disappearing almost entirely, and under the influence of hot sulphuric acid is changed into a dark brown or black liquid. Bromine reacts violently with menthol, vapors of hydrobromic acid being given off, while a dark purplish oily liquid remains. From the solutions in ether or chloroform menthol is obtained in feathery or somewhat stellately arranged needles. Sodium introduced into melted menthol liberates hydrogen, and a glassy mass is left, which on exposure becomes brown, opaque and deliquescent.

A very good vehicle for the application of menthol is oleic acid, in which it is freely soluble, and as an application in toothache a solution is very serviceable in the proportion of 20 grains of menthol in one and a half drachms of chloroform.—*Amer. Jour. Pharm.*, Sept. 1885, 429-430.

Menthol—Anæsthetic Action.—According to Dr. Rosenberg a 20% ethereal solution of menthol possessed the property of diminishing the sensibility of the throat, and in some cases induced a nearly complete anæsthesia. A stronger solution abolished sensibility for three minutes, the return to the normal condition then taking place gradually. The author recommends, however, that for application to the larynx the strength of the solution should not exceed 10%, otherwise it is liable to provoke coughing.—*Pharm. Jour. and Trans.*, May 1, 1886, 920.

Volatile Oil of Buchu—Chemical Characters.—Professor Spica has subjected the volatile oil of *Diosma crenata* to chemical examination, and obtained results differing in some respects from those obtained by Prof. Flückiger (see Proceedings 1881, p. 288) with the volatile oil of *Barosma betulina*. By treating the freshly prepared oil with caustic potassa, it was separated into an elæoptene and a stearoptene. The elæoptene constitutes a greenish yellow oil, with a pleasant odor, recalling that of the plant, and an aromatic, pungent, and cold taste, like that of peppermint. By fractioning, it gave a portion isomeric with borneol, boiling at 204° – 206° C., and another of higher boiling point and containing less carbon. The former, when treated with sodium, readily yielded a yellowish liquid, resembling thymol in smell and taste, and corresponding in composition to the formula $C_9H_{12}O$, which the author has named “*dioscamphor*.” The stearoptene, which was obtained in handsome long white needles, had a peculiar camphor-like odor, melted with partial sub-

limation at 82° C., boiled at 200° C., was purely soluble in ether and in alcohol, but slightly soluble in water. It therefore agreed in these characters with the stearoptene described by Prof. Flückiger under the name of "diosphenol;" but upon analysis it gave figures corresponding to the formula $C_{19}H_{16}O_2$, and is taken by Prof. Spica to be an "oxycamphor." From the leaves, after the removal of the volatile oil, another substance was extracted by alcohol; this Professor Spica names "*diosmin*," and he promises a description in a future communication.—Ann. di Chim. Med. Farmac., 1885, 333; Pharm. Jour. and Trans., Aug, 1, 1885, 106.

Eucalyptus Oils—Source.—Mr. Peter MacEwan contributes a very interesting paper on eucalyptus oils, in which he shows that the commercial oil is principally derived from *E. amygdalina*, and not from *E. globulus* as generally supposed. Latterly an oil has been introduced under the designation of *Ol. Eucalypti dumosæ*, which is obtained from the so-called *mallee-eucalypti*, shrubs indigenous to the desert tracts of Australia, and consisting principally of *E. incrassata*, together with *E. oleosa*, *E. uncinata*, and *E. gracilis*. The distinctive characters of the commercial eucalypt oils are shown in the following table:

		Specific Gravity.	Odor.	Color.	Solubility of Salicylic Acid.	Solubility in S.V.R.	Rotatory Power $[\alpha]_D^{20}$	Effect of Sodium.	Effect on Blue Litmus.
GROUP I.	A.	0.887	Cajuput.	None.	1 in 5	1 in 5	-2° 62	Dark yellow	Neutral.
	B.	0.889	"	"	1 in 6	1 in 6	-2° 78	Pale red.	"
	C.	0.883	"	"	1 in 8	1 in 8	-35° 50	Dark yellow	Feebly acid.
	D.	0.880	Fragrant.	Straw.	1 in 9.5	1 in 9.5	+46° 70	Red.	Acid.
	E.	0.886	Fragrant, like mint	"	1 in 10	1 in 10	-21° 57	"	"
	C L	0.876	Very fragrant.	Dark yellow	1 in 15	1 in 10	+32° 25	"	Very acid.
GROUP II.	F.	0.874	Fragrant.	Straw.	1 in 14	1 in 3.5	-43° 35	"	"
	G.	0.872	Very fragrant.	Dark yellow	1 in 15	1 in 4	+30° 50	Dark red.	Intensely acid.
	H.	0.867	"	"	1 in 15	1 in 5	+37° 50	Yellow.	Feebly acid.
	I.	0.862	Fragrant.	"	1 in 15	1 in 5	+22° 56	"	Neutral.
	K.	0.876	"	"	1 in 16	1 in 6	+32° 50	"	Acid.
	E D	0.916	Cajuput.	None.	1 in 5	1 in 1	+1° 25	None.	Most acid.
	E G	0.877	"	"	1 in 10	1 in 9. absolute alcohol.	-35° 82	Red.	Neutral.

A. B. and *E.* are the *E. amygdalina* oil of one maker, and evidently fresh, as indicated by their neutrality; *D* of unknown source; *C* is sent out as *ol. Eucalypti globuli*; *F* and *G* are guaranteed *E. amygdalina* oils. The others are all of unknown origin. For further details reference must be had to the author's paper in Yearbook of Pharm., 1885, 402-408.

Myrtol—Physiological Action.—According to Dr. Linarix, myrtol possesses both antiseptic and disinfecting properties. It stimulates the digestive faculties and increases the appetite; in small doses it acts as a sedative. It is eliminated both by the kidneys and lungs, and is more

easily tolerated than most balsamic bodies. Applied externally it does not produce irritation unless the skin is abraded, and the trifling burning sensation then produced soon passes off. Six capsules daily, each containing 15 centigrams, form a moderate dose, and it is usually administered before meals.—Phar. Jour. and Trans., May 1, 1886, 919; Brit. Med. Jour., April 10, 1886, 708.

Oil of Sandal Wood—Characters etc., as Obtained from Different Sources.—Mr. E. M. Holmes calls attention to oil of sandal wood that has lately appeared in the market with the affix “W. I.,” indicating the West Indian origin of the oil or of the plant from which it is derived. As the genus *Santalum* is not represented on the American continent it is evident that the “West Indian” oil must be derived from some other plant, and the author accordingly instituted the necessary inquiries. He found that the wood yielding the “West Indian” oil reaches Germany from Puerto Cabello, in Venezuela. This wood is evidently distinct from the true sandal wood, but living specimens of the plant having died in transit, the author is at present unable to identify the plant, though as far as can be judged from the leaves, it belongs to the *Rutaceæ*. After giving a brief description of the species of *santalum* that have at different times furnished the sandal wood of commerce, the author proceeds to the consideration of the oils of sandal wood of commerce. The oils of commerce, unless the wood yielding the Macassar oil proves to be derived from a distinct species, are at present obtained exclusively from two sources, viz., *Santalum album*, furnishing the East Indian and Macassar oil, and the Venezuela tree furnishing West Indian “sandal wood oil.” A comparatively small proportion of oil is imported from India, but it often reaches England in a discolored state, and contains fixed oil and water. The oil distilled in England realizes a higher price than either the Indian or German oil, the latter in some cases containing oil from cedar wood, or from inferior sandal, mixed during the distillation. Nevertheless it is conceded that the continental distillers are far in advance of the British in their superiority both of plant and of the knowledge necessary for the production of this and other essential oils, two well-known German firms distilling three-quarters of the whole quantity used in Europe.

At the request of Mr. Holmes, Mr. W. H. Ince subjected a number of different commercial samples of sandal wood oil to examination, with a view to ascertain what variation might exist in their specific gravity. The results were as follows :

	Distilled in	Sp. gr.	Source.
1.	Germany	0.9797	E. Indian wood.
2.	“ same firm	0.9754	“
3.	“ different firm	0.9756	“
4.	“ same firm as 1 and 2	0.9738	Macassar wood.
5.	“ same firm as 1 and 2	0.9650	W. Indian wood.
6.	English	0.9713	E. Indian wood.

The statement having been made to Mr. Holmes that the oil distilled in Germany is sometimes adulterated with cedar wood oil, some experiments were made with a view to its detection. It is found, however, that whilst cedar wood oil may be recognized by its insolubility in an equal volume of alcohol of sp. gr. 0.920, its admixture with sandal wood oil to the extent of 10 per cent. cannot easily be detected.—Phar. Jour. and Trans., March 27, 1886, 819-822.

Oil of Sandal—Fluorescent Character.—Mr. F. H. Alcock draws attention to two specimens of sandal oil that have recently come under his notice, both of which possessed strong fluorescence. He had noticed fluorescent oils of sandal before, but the character never was so marked in previous instances. One of the samples was labeled "Essence Sandal Wood, E. I.," the other "Oil of Sandal Wood, West Indian." The action of sulphuric acid on them was the same as that previously observed by the author, except that he noticed around the margin of each, after treatment with the acid, a salmon-tinted ring. The sp. gr. of the oils was 0.9649 and 0.9573 respectively.—Phar. Jour. and Trans., May 1, 1886, 923.

Oil of Rose—Distillation from flowers growing in Germany.—An experiment in the distillation of oil of rose from the petals of flowers grown in Germany has been made by a firm in Steinfarth with favorable results. From 25 kilograms of *R. centifolia* petals 16 grams of oil were obtained, whilst similar quantities of "Bourbon," "Remontant" and "Tea" rose petals only yielded 6 grams. In consequence of the care exercised in the collection and distillation of the petals, the rose oil obtained is said to have been superior to Turkish oil in aroma. It solidified at 32° C., whereas the average solidifying point of the Turkish oil is 20° C. Several years ago (see Proceedings 1883, 262) Messrs. Schimmel & Co. reported similarly favorable results.—Pharm. Jour. and Trans. Aug. 3, 1886, 839; Pharm. Rundsch., March 1886, 64.

Oil of Star Anise—Method of distillation in Annam.—See *Star Anise* under "Materia Medica."

Cumol—Production from Diphenylpropane.—By heating 1 part of aluminium chloride with five parts of diphenylpropane, Silva obtained cumol, a considerable quantity of benzol, and a tarry substance. Cumol thus obtained boiled at 158°-160° C. Silva believes it to be the normal propyl-benzol.—*Chemiker Zeitung*, ix, p. 1770.

Volatile Oil of Anthemis Cotula—Characters, etc.—See *Anthemis Cotula* under "Materia Medica."

Oil of Bitter Almonds—Percentage of Prussic Acid.—Mr. J. O. Braithwaite has determined the specific gravities and the percentage of prussic acid in some samples of oil of bitter almonds and oil of peach seeds, with the following results:

A. Ol. Amygd. Ess.	sp. gr. 1.072 = HCy	6.38%
B. "	1.068 — "	5.30%
C. Ol. Amygd. Persic. Ess.	1.068 — "	5.50%
D. "	1.065 = "	4.15%

—Pharm. Jour. and Trans., Jan. 30., 1886, 659.

Iodol—Preparation and Uses.—Dr. Mazonni finds iodol free from the disagreeable odor of iodoform, and that it does not produce symptoms of intoxication. It is a powerful antiseptic, aiding the formation of healthy granulations and occasionally producing local anæsthesia. Iodol is prepared from volatile animal oil by precipitating the pyrrol with a solution of iodine in iodide of potassium, thus forming pyrrol tetraiodide, or iodol. It is a brown powder, capable of being heated to 100°C. without decomposition; at a higher temperature it is decomposed, giving off iodine vapors and leaving a voluminous coke as residue. Iodol is very slightly soluble in water, and readily soluble in strong alcohol, but precipitated again on adding water. The addition of glycerin to the alcoholic solution does not precipitate it. Ether and chloroform also dissolve it. Tests: Sulphuric acid produces a green color, and by heating the alcoholic solution to which nitric acid has been added a bright red color is produced.—Amer. Jour. Pharm., Dec. 1885, 608; from Rundschau, xi, p. 668.

Iodol—Description.—Dr. Vulpus describes iodol as forming a light brown microcrystalline powder, tasteless, having a faint thymol like odor, containing 90 per cent. of iodine, and giving off iodine vapor at 100° C. It is nearly insoluble in water, moderately soluble in hot oil, freely soluble in ether and in chloroform, and soluble in three parts of alcohol, from which solution it is not precipitated by the addition of glycerin. It is claimed that besides possessing antiseptic properties, comparable to those of iodoform, iodol exercises a local anæsthetic action and promotes granulation of sores, whilst it has an advantage over iodoform in respect to odor.—Pharm. Jour and Trans., Oct. 31, 1885, 367.

Iodol—Value as Compared with Iodoform.—Mr. Marcus finds, in support of clinical experience in the Berlin Hospital, that iodol not only possesses the advantage over iodoform in being devoid of odor, but that there is less danger of toxic accidents following its topical application. Introduced directly into the vessels of an animal it manifested in equal doses a lower degree of toxicity than iodoform. When applied simply to the surface of a wound, or to the surface after the removal of the skin, or when injected only in small quantities, no toxic symptoms were observed. In antiseptic power it is said to be equal to iodoform.—Pharm. Jour. and Trans., June 26, 1886, 1087; Gaz. Méd., May 29, 1886, 259.

ALCOHOLS.

Alcoholic Liquids—Clarification.—Mr. E. Dieterich recommends the

following mixture for clarifying alcoholic liquids: Dried egg albumen 40 p., sugar of milk 40 p., starch 20 p. Mix and reduce to a very fine powder. To clarify alcoholic liquids, mix them with the powder in the proportion of 5 gm. per liter (about 75 grains per quart), and shake well and repeatedly during several days, keeping the liquid in a moderately cool place. Then filter.—*Amer. Drugg.*, March 1886, 57; from *Pharm. Centralhalle*, 1885.

Alcohol—By-product in Bread-baking.—Experiments reported by R. K. for the recovery of the alcohol eliminated by the baking process, gave the following result: On baking 3 kilos of dough 150 gm. of distillate of 0.9801 sp. gr. were obtained, equal to spirit of 13 per cent. or 15.6 grams of alcohol. Supposing that the oven be used four times a day for baking 50 loaves of bread, weighing 2 kilos each, the liquid condensed by means of suitable arrangements during a year would contain 730 liters of alcohol.—*Amer. Jour. Pharm.*, Sept. 1885, 436; from *Schweiz. W. f. Ph.*, No. 24, 1885.

Alcohol.—Removal of Fusel oil by the aid of *Paraffin*, which see under "Hydrocarbons."

Grape Brandy—Character of Odor.—Mr. Ordonneau has made some investigations concerning the cause of the peculiar odor of brandy made from wine. That of brandy (the direct distillate?—Rep.) prepared from other materials, such as maize, beet, and potatoes, is characterized by what is known to French experts as the "odeur de trois-six," which is not present in grape brandy; an odor which has been traced by the author to the presence of isobutylic alcohol. In genuine cognac brandy the predominating flavor is due to the presence of normal butylic alcohol, which is present to the extent of 216.60 grams per hectolitre. The production of this alcohol appears to be due to the presence of *Saccharomyces ellipsoideus* in the grape juice, since it can be developed from the ordinary refinery liquid by fermenting it with the sediment of wine. The isobutylic alcohol, on the other hand, appears to be a secondary product of the fermentation with beer yeast. It might therefore be possible in future to obtain brandy of good flavor by fermenting malt liquor with the *Saccharomyces ellipsoideus*. The other flavoring product to which brandy owes its peculiar bouquet appears to be a terpene boiling at 178° C. the products of the oxidation of which characterize old brandy. The author gives an analysis of cognac brandy, from which it appears that amylic and normal propylic alcohol and acetic ether form the principal ingredients, besides ethylic alcohol, although propionic, butyric, caproic and ænanthic ethers, pyridine, and probably collidine, are present in minute quantities.—*Pharm. Jour. and Tran.*, Feb. 27, 1886, 724; *Compt. rend.*, cii. 217.

Midzu-Ame—A Japanese Malt Extract.—Mr. E. M. Holmes describes

a Japanese malt extract, called "Midzu-ame," which is highly prized by the Japanese. It is a liquid thicker than treacle, having the color and translucency of honey. When kept in a warm room it appeared to undergo fermentation, and a white froth arose which gradually filled the bottle, which was only three parts full, and raising the stopper, overflowed the mouth of the bottle. The froth, however, possessed the remarkable character of becoming quite hard very rapidly, so that it could be broken in pieces like sugar. As the autumn approached and the weather became cooler, the fermentation ceased entirely. The method of preparation has hitherto been kept secret, but has lately become public, and is given as follows:

1st. *Malt* (Moyashi). This is made by putting barley into a pail with a perforated bottom, moistening it for two weeks with water, during which time the barley germinates, sooner or later according to the weather. It is then spread out to dry, the sprouts are rubbed off and winnowed away, and the malt is ground, when it is ready for use.

2d. One *to* (= 1097 cubic inches) of *mochi-gome*—the very glutinous rice used to make *mochi*—is cooked by steaming it in a wooden box till soft. It is then emptied into a pail and 450 *momme* (about $3\frac{3}{4}$ lbs) of malt are added, with 5 *sho* (equal to half a *to*) of water. The whole is then thoroughly mixed with the hands, the rice being squeezed and crushed till it assumes a hard jelly-like consistence. It is then allowed to remain for twelve hours, during which time it is stirred thrice. During this stage of the process it is covered with straw mats if the weather be very cold, or kept in a cool place if the weather be warm. It is then removed and placed in hempen bags, put into a strong box, and the liquid expressed by firm pressure. Lastly it is evaporated to a proper consistence over a slow fire. The taste of "*midzu-ame*" is slightly sweet and by no means unpleasant. It was, until recently, used in south-western Japan only as an article of diet for babies, weakly children and old people, but is now largely used by instruction of foreign physicians.—Pharm. Jour. and Trans., Feb. 20, 1886—701-702.

Sam-Shu—A Peculiar Chinese Rice Liquor.—Mr. Charles E. Munsell draws attention to this liquor, known as *today*, *arrack*, *saki*, *tsin*, and other names in Eastern Asia, is distilled from the yeasty liquor in which boiled rice has fermented for many days under pressure. Only one distillation is made for common liquor, but when greater strength is desired two or three distillations are made; and it is this strong spirit alone which is rightly called *Sam-shu*, a word meaning "thrice fired." This liquor, which has the color of rich sherry wine, has been analyzed by the Health Department of New York City, with the following results:

Specific Gravity at 18° C.	94.84
Percentage of Alcohol, by weight	38.81
“ “ “ “ volume	45.70
“ “ Saccharose	5.39
“ “ Glucose	1.19
“ “ Mineral constituents.	.06
“ “ other Organic Solids	2.80
“ “ Total Solids	9.44

Dr. J. P. Battershall, of the United States Laboratory, Port of New York, obtained the following percentages of Absolute Alcohol in samples of this “Chinese Medicine”:

	Volume.	Weight.
No. 1	44.50	37.50
No. 2	33.10	27.27
No. 3	52.00	44.42

These analyses show that *Sam-shu* contains as much alcohol as any liquor usually sold.—*Amer. Jour. Pharm.*, Feb. 1886, 94; from *Jour. Am. Chem. Soc.*, 1885, p. 243.

Sulphovimates—Instability.—Mr. T. L. Phipson observes in respect to sulphovinate of sodium, which several years ago was recommended by Dr. Rabuteau and others as an elegant substitute for sulphate of sodium in pharmacy, that it has since been discovered that the sulphovimates are very unstable and quite unfit for medical use. The sulphovinate of sodium becomes transformed in time into bisulphate of sodium, which would act more or less as a poison with the doses in which the sulphovinate was prescribed, and some fine, transparent crystals of sulphovinate of barium prepared in the author's laboratory, three years ago, have become quite opaque and changed into sulphate of barium.—*Chem. News*, Nov. 13, 1885.

Ether—Oxidizing Action.—Mr. Emil A. Werner criticises the requirements of the B. P. that ether shall not liberate iodine from iodide of potassium nor form an encrustation on hydrate of potassium. He has been unable to find a sample of ether, however pure, that would not liberate iodine from iodide of potassium, as indicated by the starch paste or, at all events, cause an abundant encrustation on KOH: the latter purity being attained only by one sample. He is convinced that this action of ether is due to the readiness with which ether forms ozone in contact with atmospheric air, a fact noticed years ago by Schoenbein. Indeed Buchner (see *Proceedings* 1885, 267) has already noticed the reaction of pure ether upon iodide of potassium, and properly attributes it to the formation of ozone. Mr. Werner's experiment convinces him that the reaction is not due to aldehyde, as believed by Mr. Warden (*loc. cit.*, 267), but to ozone as determined by Buchner. He finds in support of his view that pure mercurous iodide when treated with ether from which

ozone had been carefully removed gave no evidence of mercuric iodide, but when treated with a sample of ether not treated for the removal of ozone it immediately gave evidence of the presence of mercuric iodide.—Pharm. Jour. and Trans., Feb. 6, 1886, 661-663.

Ether—Hydrogen Peroxide and Aldehyde as Impurities.—Boerrigter confirms the statements of other authors that ether frequently contains hydrogen peroxide and aldehyde. Ether should be kept in dry, tightly corked bottles. The ozone produced by the evaporation of ether, if water is present, converts it into hydrogen peroxide. Pure ether is not discolored by caustic potash, nor is alcohol affected by it unless air has access, when possibly aldehyde is formed.—Amer. Jour. Pharm., Dec. 1885, 606; from Phar. Zeit. f. Russl., xxiv., p. 584.

Ether—Impurities.—Mr. B. J. Boerrigter draws attention to various impurities in ether, but particularly peroxide of hydrogen, which otherwise pure ether very often contains. Such ether can be purified by treatment with caustic potassa. He recommends that ether be kept dry and well corked. He finds that peroxide of hydrogen can exist in the ether along with other strong reducing substances, and considers it probable that when peroxide of hydrogen is present, the presence of aldehyde can also be determined.—Arch. d. Pharm., July (1), 1885, 532-536.

Ethyl Hypochlorite—Preparation and Properties.—According to Mr. Sandmeyer, the ethyl ether of hypochlorous acid can be obtained by passing gaseous hypochlorous anhydride directly into alcohol until saturated, and then adding water, which causes it to separate. It is, however, most conveniently prepared by passing a current of chlorine into a solution of one part of soda in ten parts of water, cooled by means of ice, as long as any is absorbed, then immediately adding one part of alcohol. The liquid at once becomes turbid, and after a few minutes, ethyl hypochlorite separates as an oily layer on the surface, which, after removal, should be washed with water and transferred to a vessel containing chloride of calcium. The ether is yellow, mobile, very volatile, has a strong hypochlorous smell, and is very irritating to the respiratory organs. It boils at 36° C., and distils without decomposition; but if a few drops be overheated in a test tube, the vapor explodes violently with flame, and a similar explosion takes place upon the addition of precipitated pulverulent copper to the liquid ether. If the ether be exposed to the sunlight, even when surrounded by ice-cold water, it soon commences to boil stormily and ends by exploding; but in weak diffused light it remains unaltered or only becomes heated and volatilizes without explosion.—Pharm. Jour. and Trans., Nov. 28, 1885, 448; Ber. d. D. Chem. Ges., xviii., 1767.

Oxalic Ether—Preparation and Uses.—Dr. Richardson recommends this compound for hypodermic injection. It is obtained by diges-

ting absolute alcohol and oxalic acid at a moderate temperature, and is a colorless liquid of an agreeable odor. Unlike sulphuric ether, it does not cause pain when injected under the skin, and the resulting inflammation is slight. It is suggested as a useful application to morbid growths, either externally or by deep injections.—*Amer. Jour. Pharm.*, Oct. 1885, 505; from "*Asclepiad*," through *N. Y. Med. Jour.*, June 20, 1885.

Acetic Ether—Commercial Quality.—Mr. Luther P. Bowers has examined three commercial specimens of acetic ether with the following results: One was very impure, had the specific gravity .924, was extremely acid to litmus paper, effervesced strongly with calcium carbonate, and afforded clear solutions with alcohol and ether, but would not dissolve in chloroform. Ten cc. of it agitated with an equal volume of water, separated an ethereal layer of 7 cc. The ether had an empyreumatic odor and on evaporation left a yellowish residue. The second sample had the specific gravity .904, effervesced with calcium carbonate, and showed an undue loss on being agitated with water, but was much better than the preceding. The third sample effervesced slightly with calcium carbonate, and had the unusually low specific gravity .878, but otherwise answered to the requirements of the *Pharmacopœia*.—*Amer. Jour. Pharm.*, Jan. 1886, 12; from the author's thesis.

Acetic Ether—Value in Poisoning by Illuminating Gas.—Dr. Leube states that he has used acetic ether where employees in gas-works had become insensible from the inhalation of illuminating gas. He gives several drops on sugar, the patients soon revive, and in a very short time are again able to work.—*Amer. Jour. Pharm.*, Dec. 1885, 604; from *Archiv. de Pharm.*, 1885, p. 716.

Ethyl Nitrite—Deterioration in the Spirit and Changes by Keeping.—Mr. Alfred H. Allen, in continuation of his former investigations (see *Proceedings*, 1885, 268), communicates the results of experiments since made, which confirm substantially his previous views and conclusions. Regarding the keeping qualities of spirit of nitrous ether he remarks that one of the principal causes of its deterioration is the presence of water, which is so frequently added to reduce cost.—*Yearbook of Pharm.*, 1885, 463-469.

Concentrated Nitrous Ether—Quality and Uses.—Mr. L. E. Sayre has examined the spirit of nitrous ether as well as samples of concentrated nitrous ether of commerce, and finds that in the main the spirit of nitrous ether of commerce is not so satisfactory as a preparation made by mixing a carefully selected concentrated nitrous one, from reputable manufacturers, with the proper quantity of alcohol. He has found the weakest so prepared to contain 1 % of ethyl nitrite, whilst the best commercial spirit only contains a little over one per cent., and the purest a little over .09 per cent. of ethyl nitrite.—*Proc. Penn. Phar. Assoc.*, 1886, 148-151.

Chloroform—New Source.—Mr. Gustavus Michaelis claims to have discovered a method of producing chloroform at greatly reduced cost, and, at the same time, of better quality. Alcohol as a base is not used, and thus the cost of chloroform is lessened one-fourth. Wood is decomposed at high temperatures, and from the residual crude acetates which arise from the proper chemical treatment of the products of the decomposed wood, other products are secured from which the chloroform is obtained. A residual matter is also obtained which yields acetic acid, or purified acetates. Part of the Aniline Works have been secured, and a plant is in position which will enable the company to put out 500,000 pounds of chloroform per year, with unlimited possibilities of growth.—*Amer. Drugg.*, Nov. 1885, 215; from *Oil, Paint, and Drug Rep.*

Chloroform—Use as a Hemostatic.—Chloroform as a hæmostatic in minor surgical operations, especially in the mouth and throat, is recommended by Dr. Spaak; it is used in one per cent. aqueous solution.—*Amer. Jour. Pharm.*, Feb. 1886, 104; from *Wien. Med. Blätter*, 1885, No. 41.

Iodoform—New Method of Preparation.—Mr. Heinrich Spindler has made the interesting observation that iodoform and the corresponding ethyl compounds, &c., can be prepared from the chlorides, bromides, or chlorobromides of the paraffin series by reaction with an inorganic iodide. Thus if chloroform and anhydrous iodide of calcium are heated together at a temperature of 75° C. (167° F.), even for 120 hours, not the least formation of iodoform could be discovered. It began to be gradually formed, however, when the temperature was raised to 120° C. (243° F.). The results obtained with crystallized (hydrated) iodide of calcium, however, were entirely different. The iodide which the author experimented with was obtained from H. Trommsdorff, in Erfurt, had a whitish or yellowish color, and had been fused in its water of crystallization. It appeared in fused, radiately crystalline, very hygroscopic pieces, melting between 70° and 80° C. (158°–176° F.). On allowing it to lie exposed to the air, it gradually decomposed with liberation of iodine. Heat accelerated this decomposition. On analysis it was found to contain 17% of water, corresponding to the composition $\text{Cl}_{12} \cdot 3\frac{1}{3} \text{H}_2\text{O}$, the fraction being probably due to loss of water during the final melting of the iodide. The author made his experiments on a small scale, and in tubes which were fused at the end, after the substances had been introduced. It was found that it was necessary to exclude every trace of water except that already contained in the iodide of calcium, and the great avidity of this salt for water made rapid working necessary.—*Amer. Drugg.*, April 1886, 67; from *Liebig's Annal.*, 231, 257.

Iodoform—Decomposition by Light.—Mr. Hebelers has observed that an ethereal solution of iodoform, when exposed to light, acquires a brown

tint, gradually becoming darker, due to the liberation of iodine. He says that this action of sunlight may be retarded by the addition of a small quantity of alcohol, but to prevent the alteration in ethereal solutions it is necessary to preserve them in black or brown bottles. The dissociating action of sunlight is also exercised upon the superficial layers of ointment containing iodoform if exposed. The author says that the change of color varies with the excipient, being either blackish-brown, violet-red, or red; the latter being the color with benzoated lard, which he accordingly recommends as the best vehicle. *Pharm. Jour. and Trans.*, June 26, 1886, 1088; *Gaz. Méd.*, May 29, 1886, 259.

Iodoform—Deodorization.—In a paper on the deodorizing and prescribing of iodoform, Dr. Stout states that in his attempt to deodorize or modify the odor of this compound without altering its therapeutic effect he has obtained the best results with coumarin, vanillin, and cinnamic acid, and that any of these three compounds may be used in all cases suggesting the use of iodoform. Iodoform combined with one-fifth of its weight of cinnamic acid, and used as a very fine powder, was found to be an excellent application, the cinnamic acid acting both as a deodorizer and an antiseptic. Coumarin (1 part to 9 parts) seemed to cover the odor of iodoform best, but equal parts of coumarin and vanillin or of all three gave a pleasant result. The author recommends that the iodoform and the deodorizer should be thoroughly incorporated and allowed to stand one or two months before use. *Pharm. Jour. and Trans.*, Oct. 3, 1885, 288; from *Therap. Gaz.*, Aug. 1885, 511.

Iodoform—Action of Sunlight.—According to Mr. Dacomo, iodoform is completely decomposed by sunlight in the presence of oxygen. The decomposition does not take place when the iodoform is kept in vacuo, or in gases which are indifferent. The reaction is as follows: $2\text{CHI}_3 + 5\text{O} \rightarrow 3\text{I}_2 + 2\text{CO}_2 + \text{H}_2\text{O}$.—*Amer. Jour. Pharm.*, March 1886, 128; from *Pharm. Zeitung*, 1886, xxxi, p. 19.

Iodoform—Volatility.—Mr. D. B. Dott found that iodoform loses 0.016 per cent. per hour when exposed to the air in a thin layer at ordinary temperature. With the heat of a water bath it loses 6.70 per cent. in the hour.—*Yearbook of Pharmacy*, 1885, 418.

Iodoform—Antidote to Poisoning.—Dr. Behring found hourly doses of a tablespoonful of a 20% solution of bicarbonate of potassium to act as a prompt antidote in iodoform poisoning.—*Amer. Jour. Pharm.*, Sept. 1885, 459; from *Louisville Med. News*.

Paraldehyde—Use as an Antidote to Strychnine.—Profs. Árpád Bókai, Cervello and Dujardin-Beaumetz recommend paraldehyde as an antidote to strychnine. Prof. Bókai also found it valuable as a counter-poison to brucine, thebaine, and picrotoxin.—*Amer. Jour. Pharm.*, Sept. 1885, 436; from *Chem. Ztg.*, No. 54, 1885.

Chloral Hydrate—Examination of Commercial Samples.—Mr. B. D. Westenfelder has examined four commercial samples of chloral hydrate. Besides several tests prescribed in the Pharmacopœia, one gram of each was decomposed by caustic soda, the excess of alkali being afterwards determined volumetrically by one-fifth normal oxalic acid. The results are as follows:

	Boiling point.	Solidifying point.	Per cent. chloral hydrate found by titration.	Reaction with nitrate of silver.
No. 1 . . Neutral.	98° C.	49.8°	100.0	Clear.
No. 2 . . Acid.	98°	48°	98.5	Distinct opalescence.
No. 3 . . Slightly acid.	98°	48°	98.0	Clear.
No. 4 . . Acid.	97°	48°	99.3	Distinct opalescence.

All were completely volatilized when heated on platinum foil, were free from blackening when warmed with sulphuric acid, and yielded no iodoform in testing for alcoholate.

Nos. 1 and 3, in saccharoid masses, were more readily soluble in water than No. 2, which was in crystals.—*Amer. Jour. Phar.*, May 1886, 233-234.

Chloral Hydrate—Examination of Commercial Specimens.—Mr. Chas. Erastus Weck has examined six commercial samples of chloral hydrate, and found them to agree fairly with the requirements of the Pharmacopœia. Three of the samples, however, showed the presence of decided traces of alcoholate, whilst slight indications were obtained with the remaining three. Mr. Joseph V. Roberts also examined three samples, all of which were found to be free from alcoholate by the total absence of a precipitate of iodoform after proper treatment. Two of the samples were neutral to test paper, in diluted alcohol solution, and gave no turbidity with silver nitrate, while a precipitate was produced with the third specimen, the reaction of which was decidedly acid.

Chloral Hydrate and Phenol.—The liquefied mixture of the two compounds was placed in a freezing mixture by Mr. Roberts, but did not congeal; the hot aqueous solution, treated with ammonia and nitrate of silver, readily gave a metallic mirror.

Chloral Hydrate and Camphor.—The results of the experiments were the same as in the preceding case.—*Amer. Jour. Phar.*, June 1886, 281.

Chloral Hydrate—Action of Water.—Mr. Guérin states that nearly all the samples of chloral hydrate supplied as pure to French pharmacists, redden litmus and give solutions that are precipitated by nitrate of silver. He has observed that these indications of alteration are most manifest in samples having a saccharoid appearance, formed of confused rhombohedral crystals, whilst they are rarely observed in samples of chloral hydrate occurring in large rhombohedra, obtained by crystallization from chloroform or from bisulphide of carbon. The author believes that the defect

in the former variety is attributable to the action of a certain amount of retained water, due to the method of its preparation. If pure chloral hydrate be dissolved in cold distilled water, and a few drops of litmus be added, no change of color takes place at first, but gradually the solution reddens, indicating the progress of the decomposition; if the solution be heated to 100° C. the reaction takes place immediately. The products of decomposition appear to be formic and hydrochloric acids.—Pharm. Jour. and Trans., June 26, 1886, 1088; Arch. de Pharm., June 1886, 253.

Chloral Hydrate—Incompatibility with Alcoholic Preparations.—Prof. George F. H. Markoe draws attention to the incompatibility of chloral hydrate in presence of alcoholic preparations. A mixture, composed of $\mathfrak{z}$ iii. each of chloral hydrate and bromide of potassium and $\mathfrak{z}$ iss. each of tr. opii et camph. and syr. zingiber, was found to form two layers. A homogeneous liquid was formed upon substituting water for the tincture; whilst, upon substituting diluted alcohol for the tincture, a liquid composed of two layers was formed, as in the original case. The author attributes the difficulty to the formation of the less soluble chloral alcoholates, which, in the presence of the potassium bromide, determines the separation of the liquid into two layers.—Amer. Jour. Pharm., Aug. 1885, 370–372.

Chloral Hydrate—Incompatibility with Saline Compounds in Presence of Alcohol.—Mr. A. Convert, referring to Prof. Markoe's observation, remarks that he has found chloral hydrate to be incompatible in presence of alcohol with concentrated solutions of bromide and chloride of ammonium. On the other hand, he found that nitrate of potassium is not incompatible, that is to say, it does not produce a separation of the liquid into two layers. This he accounts for by the fact that the nitre is but sparingly dissolved in the alcoholic fluid.—Pharm. Rundschau, Sept. 1885, 204.

An error in the proportions of potassium bromide, chloral hydrate, water, alcohol and ginger syrup, stated to have been used by Prof. Markoe in his experiments, has given rise to much criticism in different journals, which Prof. Markoe disposes of by stating that he had used in his experiments the exact proportions of ingredients as was directed in the original prescription, viz., potassium bromide and chloral hydrate, each 90 grains, water and alcohol, each 3 fluidrachms; ginger syrup, 6 fluidrachms. The results were as stated in his first paper. In reply to an English criticism that the separation is due to the presence of sugar, the author states that the separation will occur when the syrup is omitted, though in the presence of syrup a smaller amount of alcohol is required.—Proc. Mass. State Pharm. Assoc., 1886, 176–179.

Chloral Hydrate—Compatibility with Alcohol in Presence of Bromides.—Numerous experiments convince Mr. B. D. Westenfelder that chloral

hydrate is compatible with alcohol in presence of bromides of potassium, sodium or ammonium. The following mixture gave no precipitate :

Potassii bromidum,	
Chloral hydrate	aa gr. 90
Alcohol (94 per cent.)	 3 ii.
Aqua	 3 iv.

—Amer. Jour. Pharm. May 1886, 234.

Chloral Hydrate—Action of Chlorate of Potassium.—Mr. K. Seubert has studied the action of chlorate of potassium in chloral hydrate. When 165 grams of chloral hydrate and 37.43 grams of chlorate of potassium are finely powdered and exposed to direct sunlight in a flask fitted with a reflux condenser, a reaction soon begins with great rise of temperature, and the flask must be cooled by immersion in cold water. Chlorine, phosgene gas, carbonic anhydride, and chloroform are given off. In four days the reaction is complete, and a separation of crystals takes place which may be increased by surrounding the flask with ice. The whole is then filtered and washed with absolute alcohol. Water is added to the alcoholic solution, which then yields on evaporation very pure hydrogen potassium trichloracetate. A small quantity of perchlorethane is also formed in the reaction.—Jour. Chem. Soc., April 1886; Ber. d. D. Chem. Ges., xviii, 3336-3339.

Chloral Camphor—Characters When Made in Different Proportions.—Mr. Charles W. Albright has made some experiments with chloral-camphor made by mixing chloral-hydrate and camphor in different proportions. The mixture made with 1 p. of the former and 7 p. of the latter was slightly damp after seven days, but could easily be rubbed to powder; made with 3 p. of camphor, the powder became granular in a day; and with 2 p. of camphor it was not only granular, but showed also the presence of a thick liquid. Equal parts of the two compounds soon became liquid; but with an increase of the chloral-hydrate, a white powder remained in the liquid, and when the proportion reached 7 of the chloral-hydrate to 1 of camphor, the pasty opalescent mass separated gradually a thick, oily liquid.

The liquid obtained from equal parts of the two compounds, on being agitated with water, does not decrease in bulk. It distils slowly without change and without leaving any residue when treated in a bath of ammonium chloride; but, when direct heat was applied, a portion of the oily liquid distilled over unaltered, and was followed by a white, camphor-like sublimate, which was soluble in alcohol, from which solution, on the addition of water, a thick oily liquid was precipitated. The yellowish-brown residue in the retort gave, with alcohol, a colorless solution, which had an odor of a mixture of chloral, camphor, and cedar, and with water, gave an oily precipitate. Chloral-camphor dissolves in 60 per cent.

alcohol, and on the addition of water, is again deposited unchanged. Experiments were also made upon the solubility of glycerin and water as a solvent or diluent, and upon the action of strong sulphuric and nitric acids.—*Amer. Jour. Pharm.*, June 1886, 282–283.

Chloral-Menthol — Preparation and Characters.—Mr. Harry Vane Becker suggests a combination of menthol with chloral-hydrate, which is prepared from equal weights of the two compounds, triturating them together and heating in a water bath not above 96° F., until complete liquefaction is effected. Thus prepared, chloral-menthol is an oily, colorless liquid, having a distinct mint like odor, a warm aromatic and camphoraceous taste, and at 58° F. the specific gravity 1.1984. It is completely soluble in all proportions in alcohol, freely so in benzin, and also soluble in chloroform, ether and carbon bisulphide. A few drops of the liquid brought in contact with an equal quantity of sulphuric acid, gave off almost immediately a disagreeable odor, the mixture becoming yellow, then orange in the centre, and on the border surrounded by a greenish, then green band, which soon darkened. On being now stirred with a glass rod, the mixture is blue, and dissolves in alcohol with little or no color; the solution neutralized with potassa and heated, acquires a straw color, potassium sulphate being precipitated. If the mixture of oily liquid and acid be kept for some time, two layers are formed, one being dark green, the other nearly colorless; on agitation with water, the latter is dissolved, leaving a dark green unctuous mass. Several physicians have tried the preparation in facial neuralgia, etc., and consider it far superior to menthol pencils and some other remedies hitherto in use.—*Amer. Jour. Phar.*, June 1886, 283–284.

Iodaldehyde—Preparation and Characters.—To prepare this compound Mr. P. Chautard mixes 50 grams of iodine, 20 grams of crystallized iodic acid and 150 cc. of a 30 per cent. aqueous solution of aldehyde, and allows the mixture to remain in a closed flask until the iodine is completely dissolved. On the addition of about 500 cc. water the iodaldehyde begins to separate as a heavy, oily layer, the reaction being completed in three or four days at the ordinary temperature, or in a few hours if the mixture is gently heated. The crude product is dissolved in ether, agitated with pure mercury to remove excess of iodine, and dried in a vacuum over sulphuric acid. Iodaldehyde is a colorless, limpid, oily liquid, which blackens readily when exposed to light. It does not solidify at 20° ; sp. gr. at $+20^{\circ}=2.14$. It is non-inflammable and volatile, but decomposes at 80° , and cannot be distilled without decomposition. Its solutions may, however, be heated to a high temperature without undergoing alteration. It is soluble in all proportions in alcohol, ether, benzin, chloroform and bisulphide of carbon; soluble also to a certain extent in cold water, but instantly decomposed by dilute acids. The action of numerous other agents is given by the author.—*Pharm. Jour. and Trans.*, Aug. 1, 1886, 224; from *Jour. Chem. Soc. and Compt. Rend.*

Urethan—A New Hypnotic.—Dr. V. Jaksch draws attention to a new synthetically prepared hypnotic, "Urethan," which is said to have proved prompt in its action, and unaccompanied by any disadvantageous subsidiary action. It is the ethyl ether of carbaminic acid ($\text{NH}_2\cdot\text{CO}_2\cdot\text{C}_2\text{H}_5$), forms white crystals, is freely soluble in water, inodorous, and has a not unpleasant taste, recalling that of nitre. It has been given in 0.5 gram doses, repeated in two or three hours in cases of necessity.—Pharm. Post., Aug. 15, 1885, 905; Pharm. Jour. and Trans., Aug. 29, 1885, 187.

Urethane—Therapeutic Action.—Messrs. Mairet and Combemale have found urethane to produce decided hypnotic effects in cases of functional mental alienation, when there was not too much excitement; but in cases where the mania was due to organic alteration of the brain, it had no somnolent effect. They consider the dose to be from 2 to 5 grams, and that if the latter dose do not produce the desired effect the use of the medicine should be discontinued. The remedy usually ceased to have the proper effect after from three to seven days, when it became necessary to intermit its use. It was administered by the mouth in aqueous solution sweetened and flavored, and its hypnotic action was usually manifested pretty quickly. The authors express the opinion that the indications for the use of urethane lie within narrow but precise limits, but that the fact that it is sometimes effective when other hypnotics fail, gives it in some cases a real advantage.—Phar. Jour. and Trans., May 1, 1886, 920; Compt. rend., cii. 827.

Amylic Alcohol—Formation During the Fermentation of Beer.—The formation of amylic alcohol during the fermentation of beer has been the subject of contradictory statements, some affirming and others denying that it takes place. With a view to clearing up the doubt, a number of experiments on a considerable scale and extending over a period of three years have been made by Dr. N. P. Hamberg. Working on 200 litres of ale, the quality of which was ensured, the author obtained from it 2.27 grams of amylic alcohol, which, containing a minute quantity of oil of hops, of amylvalerianic ether, and of amyl aldehyde, had a somewhat different smell from that of pure amyl alcohol. He also thinks it probable that the other alcohols which occur in brandy—propylic and butylic—may be present in ale, but he has failed to separate them by fractional distillation.—Pharm. Jour. and Trans., April 3, 1886, 839; Trans. Roy. Acad. of Science, Stockholm, 1885.

Amyl Nitrite—Preparation.—Mr. John Williams describes some of the difficulties attending the preparation of nitrite of amyl, recording the results of an extended series of experiments. The process adopted by the author, on a manufacturing scale, consists in passing nitrous acid, obtained by acting upon arsenious acid by nitric acid, into purified amylic alcohol, carefully cooled until the latter is saturated, this being shown by

the change of color from bright yellow to brownish green; beyond this point it is not safe to carry the operation. The product is washed, and subjected to fractional distillation. As a result of his experiments the author has been led to employ a mixture of nitrous acid (N_2O_3) and peroxide of nitrogen (NO_2). The latter is generated from nitric acid by the aid of copper turnings, whilst the nitrous acid is generated by the action of nitric acid, sp. g. 1.520, on arsenious acid, the latter being employed in lumps so as to control the action. The peroxide of nitrogen was passed into the upper part of the vessel in which the nitrous acid was generated, and the mixed gases were then passed into the well-cooled amyl alcohol. In this way the best results were obtained. 12 % only of the etherized liquid distilling below 90°C ., whilst 95 % distilled under 100°C ., and only 2 % more (= 97 %) under 105°C .

Very good results are, however, obtained by simply passing the nitrous acid, obtained by acting upon arsenious acid with nitric acid of sp. gr. 1.350, into pure amyl alcohol; the distillate under 100°C . and 105°C ., being respectively 93 and 95%.—Yearbook of Pharm., 1885, 472-477.

Amyl Nitrite—Assay.—Mr. Alfred H. Allen has successfully employed the process recommended by him for the assay of ethyl nitrite (see Proceedings 1885, 268), to the assay of amyl nitrite. It is necessary, however, to dilute the amyl nitrite with alcohol so as to make a 5 per cent. solution.—Yearbook of Pharm., 1885, 469-472.

Dr. A. B. Lyons recommends the process of Mr. A. H. Allen for the assay of spirit of nitrous ether for the estimation of amyl nitrite, employing, as does Mr. Allen, a 5 % alcoholic solution of the ether. The author gives some details and suggestions that may be found of service.—Pharm. Rundschau, June 1886, 135-136.

Methylic Alcohol—Occurrence in the Distillate from Fresh Plants.—Mr. Maguenne states that among the runnings that pass over first when fresh plants are distilled with water, there occurs a relatively large amount of methylic alcohol, both in the case of plants that are rich in volatile essence and in those that are poor. From fresh nettles a quantity corresponding to 0.3% of the dry plant was obtained. The author is not yet prepared to state whether the alcohol pre-exists or is produced during the distillation of the plant.—Pharm. Jour. and Trans., Dec. 26, 1885, 541; Compt. rend., ci, 1067.

Methylated Ether—Detection.—Mr. Henry Williams Jones finds that ether prepared from methylated spirit commences to boil at a much lower temperature than ether obtained from rectified spirit; and by such differences the two varieties can be distinguished. By fractional distillation, the first distillate being several times fractioned, as little as 10 per cent. of methylated ether may be found when mixed with pure ether. A convenient apparatus consists of a Glyusky's distillation tube (with thermom-

eter, attached to a flask heated by a water-bath, and connected with a Liebig's condenser. The water-bath being very slowly heated by means of a small burner, the distillation is conducted until the temperature of 90° F. is reached, when the graduated tube containing the distillate is removed and the quantity of the latter ascertained. In the experiments recorded by the author no distillate was obtained under the above conditions from pure ether; whilst 4 samples of methylated ether yielded distillates before the temperature of 90° was reached, usually to 7, 23, 54, 60% respectively.—Pharm. Jour and Trans., Feb. 6, 1886, 663.

Iodide of Methyl—Vesicant Properties.—Dr. R. Kirk has observed that iodide of methyl possesses active vesicant properties, which have hitherto escaped attention, though Sir James Simpson had previously noticed that the vapor of this compound causes intense redness lasting some days. Dr. Kirk states that when applied by pressing the mouth of the bottle containing it against the skin so as to bring the liquid freely in contact with the surface, a tingling, burning and biting sensation is produced, like that of pricking with a number of needle points, the maximum of pain being reached in a few minutes. On removing the bottle the pain instantly ceases. Redness of the surface, however, follows after several hours, and in twelve hours vesication commences and continues for twelve hours, the blister being quite as full of serum as if produced by cantharides, but there is no pain caused during the process. The iodide is best applied on lint under a watch-glass of suitable size, a drop or two of soda solution being added before it is used to neutralize any free iodine that may be present. Dr. Kirk thinks that it may be used with advantage in cases where a profound local impression is required, or when strangury is feared. Pharm. Jour. and Trans., Oct. 31, 1885, 367; Lancet, Oct. 24, 1885, 754.

Carbolic Acid—Determination of Phenol—Value in the Crude Article.—Mr. Toth gives the following method for determining the phenol value of crude carbolic acid: 20 cc. of the crude acid in a beaker is treated with 20 cc. of strong potash solution (sp. gr. 1.25 to 1.30), well shaken and allowed to stand. After about half an hour it is diluted with about 250 cc. of water, which causes the separation of the tarry constituents upon the surface of the water, from which they can easily be removed by filtration. The tarry residue is then washed with lukewarm water until it no longer shows an alkaline reaction, when the filtrate and washings are rendered very slightly acid with hydrochloric acid and diluted to 3 litres. A slight turbidity, due to a little tarry matter that passed through the filter, does not interfere with the titration. The dilution is necessary, since titrations of solutions containing more than 0.1 gram of carbolic acid in 25 cc. have been found untrustworthy. To 50 cc. of this solution 150 cc. of bromine solution—prepared by dissolving 2.040 grams bromate of sodium and 6.959 grams bromide of sodium in a liter of water

and adding 5 cc. strong sulphuric acid. After frequent shaking during about 20 minutes, 10 cc. of iodide of potassium solution, containing 120 grams to the liter, are added, and the mixture is allowed to stand not over 5 minutes; then a little starch solution is added, and the titration is made in the usual way with solution of hyposulphite of sodium, containing 6.959 grams to the liter, which corresponds exactly to 5 grams iodine.—Phar. Jour. and Trans., May 29, 1886, 1008; Zeitsch. f. Anal. Chem. xxv, 160.

Phenols—Color Reactions with Carbohydrates.—According to the experiments of Mr. Anton Ihl, the following reactions are produced by adding the pulverized carbohydrates to an alcoholic solution of the phenol.

a-Naphthol gives, with cane-sugar at a gentle heat, a splendid reddish violet color, which disappears on the addition of water; with milk-sugar a fine-violet, and with starch a dark red violet.

β-Naphthol gives, with cane-sugar, a yellow, which on prolonged boiling turns a dark greenish yellow with a greenish fluorescence; with milk-sugar, a pure yellow without fluorescence; with glucose, a yellowish green color with a strong green fluorescence; with dextrin, a yellowish; with arabin, a light yellow; and with starch, a faint yellow.

Resorcin gives, with cane-sugar, an intense fiery red, which retains its color on dilution with water; with milk-sugar, glucose, dextrin, arabin, and starch, yellowish red.

Pyrogallie acid gives reactions very similar to those of resorcin.

Phloroglucin gives, with cane-sugar, on gentle heating, an intense yellowish red color, which becomes a fine light yellow on dilution with water; with milk-sugar a reddish brown; with glucose, a yellowish red; with dextrin, a slight dirty yellow; with arabin, on prolonged heating, an intense cochineal-red pigment, which is permanent on the addition of water.

The phenols are also well adapted for the detection of woody matters. They are used in alcoholic solution, mixed with hydrochloric or sulphuric acid, and applied either hot or cold to the paper or wood in question.

Solution of *orcin* mixed with hydrochloric acid gives a splendid dark-red on wood; upon paper containing wood-stuff it gives a dark red violet spot. Pure cellulose-paper undergoes no change.

Resorcin with alcohol and hydrochloric acid colors wood-stuff paper a violet-blue in a short time. Pure cellulose-paper remains unaffected. Resorcin with alcohol and sulphuric acid (one vol. alcohol, one-third vol. sulphuric acid), when warm, colors wood-paper or wood a dark violet-blue. Pure cellulose-paper is colored an onion-red.

a-Naphthol in alcohol and hydrochloric acid colors wood stuff paper and wood greenish.

α -Naphthol, in equal volumes of alcohol and sulphuric acid, colors wood-stuff paper a dark green, whilst pure cellulose-paper takes a red-violet.

Pyrogallic acid in alcohol and hydrochloric acid colors wood-stuff paper and wood a bluish green.

Carbolic acid in alcohol and muriatic acid colors wood and paper containing wood a yellowish green.—Chem. News, 1886, p. 16; Zeit. f. Anal. Chemie; Chemiker Zeitung.

Carbolic Acid—Cause of Red Coloration.—Mr. John A. Dadd communicates some observations made respecting the cause of the red coloration of carbolic acid under certain conditions. He concludes that it is difficult to arrive at a definite conclusion as to the positive cause of the coloration, and considers it reasonable to suppose that in varied samples different causes exist. The most common would be due to the aniline compound "phtaleïn," as evidenced by the extreme sensitiveness to ammonia vapor; on the other hand, it might be due to the presence of iron, as proved by the test of Mr. Fallbusch and the experiment of Dr. Hager.—West. Drugg., Oct. 1885, 281; from Proc. Wisc. Pharm. Assoc., 1885.

Carbolic Acid—Soluble Compound with Chloral Hydrate.—Mr. Bouriez finds that when equal weights of crystals of carbolic acid and chloral hydrate are triturated together, a colorless liquid is formed, similar to that yielded by chloral and camphor, which is soluble in water in all proportions. In varying the relative proportions it was found that products were obtained that were completely soluble in water as long as the proportion of carbolic acid did not exceed 1.7 to 1 of chloral hydrate. Beyond this limit the excess of carbolic acid separated upon the addition of water. As these proportions correspond exactly to three molecular equivalents of carbolic acid to one of chloral hydrate, the compound is possibly definite. The liquid (1.7 to 1 (?))—Rep.) has a specific gravity of 1.5, possesses a mixed odor of its two constituents, and dissolves in water, alcohol, ether and glycerin in all proportions. It gives the characteristic reactions of chloral and carbolic acid, and decomposes upon slight elevation of temperature, the chloral volatilizing and leaving the carbolic acid as residue.—Jour. de Pharm. (5) xii, 166; Pharm. Jour. and Trans., Aug. 29, 1885, 188.

Phenylmethylacetone (Acetophone)—Hypnotic Properties.—This compound, having the formula $C_6H_5.CO.CH_3$, has been found by Messrs. Dujardin-Beaumetz and Bardel to possess hypnotic properties. The authors find that when given to an adult in a dose of from 0.05 to 0.15 gram, mixed with a little glycerin and enclosed in a gelatin capsule, phenylmethylacetone produces a profound sleep; and it is thought that in cases of alcoholism the hypnotic action is superior to that of chloral hydrate

or paraldehyde. So far as the experience of the authors is concerned, it has not been found to provoke intolerance; the breath of the patients, however, becomes very disagreeable through elimination of the acetone from the lungs. For convenience, the authors propose in place of the present lengthy name, the name of "hypnone."—*Pharm. Jour. and Trans.*, Nov. 28, 1885, 445; *Compt. Rend.*, ci, 960.

Hypnone—Inefficiency.—Messrs. Mairet and Combemale have experimented with four different samples of hypnone (acetophenone) and found its immediate effects upon animals—apart from a transient somnolence leaving the senses alert—to have nothing in common with sleep. Administered in therapeutic doses to a healthy man and to twenty-one patients suffering from mental affections, it produced sleep only in one instance. An article carefully prepared by the authors by Friedel's process, while apparently somewhat more energetic, still failed to show satisfactory hypnotic action.—*Pharm. Jour. and Trans.*, Jan. 30, 1886, 641; *Compt. Rend.*, ci., 1506, and cii., 178.

Aseptol—Solubilities and Antiseptic Value.—According to a report by Mr. Aneessens, aseptol (see *Proceedings* 1885, 99), is freely soluble in water, glycerin and alcohol, is far less caustic than phenol, and in its disinfectant and antiputrescent properties is superior to salicylic acid or phenol; it deserves therefore to be preferred to the latter as a prophylactic and disinfectant.—*Amer. Jour. Phar.*, Feb. 1886, 92.

Aseptol—Change of Name, etc.—Mr. Serrant, who had adopted the name of aseptol for the somewhat cumbersome name indicating its chemical constitution, viz: "Orthoxyphenylsulphurous acid," now proposes to name the new substance

Sozolic Acid, in order to avoid an erroneous inference from the termination "ol" that the compound is of a phenol character, and to indicate that it has the properties of a definite and well characterized acid. Sozolic acid is soluble in water in all proportions, and combines perfectly with bases to form salts, and it is to its capability of saturating ammoniacal bases that its antiseptic action is attributed. The author claims that sozolic acid exceeds salicylic acid in its antiseptic power, and its superiority over competing antiseptics is also claimed.—*Pharm. Jour. and Trans.*, May 29, 1886, 1005; *Compt. Rend.*, May 10, 1886, 1079.

Resorcinum—Characters.—The Pharmacopœia Commission of the German Apothecaries' Association defines the character of resorcin. It occurs in colorless, tabular or columnar crystals, having a scarcely perceptible odor, and an unpleasant sweetish-acrid taste; melts at 118° and boils at 276° C. It is readily dissolved in water, alcohol and ether, but almost insoluble in benzol, chloroform and bisulphide of carbon. Its aqueous solution has no action on litmus, is colored violet by ferric chloride, and reduces ammoniacal silver solution when heated. It leaves no residue

when heated on platinum. The maximum single dose is 3.0 grams, the daily dose 10.0.—Arch. d. Pharm., July (2) 1885, 546-547.

Resorcin—Medicinal Uses—Dr. H. S. Purten, physician in the Belfast Hospital for skin diseases, says that almost magical results have been attained in the treatment of the very obstinate disease, Lupus erythematosus, by painting the part affected with a solution containing 15 grains of resorcin to the ounce once or twice daily, and then covering with an india-rubber mask.—Brit. Med. Jour., May 15, 1886, 956.

The use of resorcin in whooping-cough is recommended by Dr. W. H. Barlow, the treatment having been originally suggested by Professor Moncorvo, of Rio de Janeiro. It is applied in the form of a 1 or 2 per cent. solution to the larynx and pharynx every two hours in the form of spray, or by means of a camel's hair pencil, great stress being laid on the perfect purity of the resorcin used.—Pharm. Jour. and Trans., May 29, 1886, 1006; Lancet, May 22, 1886, 966.

Orcin—Physiological Action, etc.—Dr. J. J. Andeer gives an account of the medicinal properties of orcin. It is a white substance with a peculiar sweetish and afterwards bitter taste, and a feeble aromatic odor, and is soluble in all the ordinary solvents. Whilst *resorcin* in small doses is purely astringent, and in large doses powerfully caustic, *orcin* in large doses is never more than astringent and antiseptic. In poisonous doses it gives tonicity to the muscles, both voluntary and involuntary, but after a time suppresses their functions, especially attacking the muscular fibres of the heart, arresting its movements and so causing death.—Pharm. Jour. and Trans., Oct. 1885, 288; from Med. Chron., Sept. 1885, 481.

Hypnone—A New Hypnotic.—Dr. Dujardin-Beaumetz proposes the name "hypnone" for methyl phenyl-acetone (methyl-benzoyl or acetophenone), which he finds to be a useful hypnotic. Hypnone belongs to the aromatic group, formula $C_6H_5COCH_3$, and was obtained by Friedel by distilling a mixture of benzoate and acetate of calcium, also by the action of benzoyl chloride on zinc methylate. Hypnone is a mobile, colorless liquid, very refractory, boils at $198^{\circ}C.$, volatile, and has a persistent odor, recalling that of bitter almonds, or cherry-laurel water; it is not inflammable, but is an active supporter of combustion; at about 4° or $5^{\circ}C.$ it becomes solid, forming large crystals. Its density is greater than water, 1 cc. weighing about 1.6 gm. Hypnone is neutral to test-paper, very soluble in alcohol, ether, chloroform and benzin. It is very soluble in the oils, particularly expressed oil of almonds. When dropped from a bottle the drops are very small, 1 cc. being equal to 39-40 drops. It is not affected by sulphuric or hydrochloric acid, nor by perchloride of iron; with nitric acid it produces a yellow coloration. Dose, 1 drop. Amer. Jour. Pharm., Feb. 1886, 102; from Archives de Pharm., i, 1.

Glycerinum—Satisfactory Commercial Quality.—Prof. Robt. B. Warden

draws attention to experiments made in the laboratory of Purdue University to determine the quality of glycerin as found in commerce. Twenty samples were tested and conformed very nearly to the requirements of the Pharmacopœia, though a very slight excess of moisture was indicated in several instances. One sample had a disagreeable odor; one also had some color, and gave distinct reaction with silver nitrate within half an hour. The manufacturers maintain a high standard of excellence, and retailers, so far as observed, do not adulterate the goods in their stores. The full paper, describing in detail the methods of examination adopted and the character of the several samples, will be found in Proceedings A. P. A. for 1885, p. 486.—Amer. Jour. Pharm., May 1886, 234.

Glycerin—Estimation.—Messrs. L. Medicus and C. Full have critically examined the process for the estimation of glycerin adopted some years ago by an association of German chemists, giving particular attention to the following points:

1. How much lime and quartz sand should be added to the samples?
2. What is the proper amount of alcohol used for extraction?
3. How should the alcohol be evaporated or distilled off?
4. How should the ether be added?

The following is the process as amended by the authors:

100 cc. of wine are evaporated on the water-bath in a capacious, not flat-bottomed porcelain capsule to about 10 cc.; 2 gm. of quartz-sand and 3 cc. of milk of lime [containing 200 gm. hydrate of calcium, $\text{Ca}(\text{HO})_2$ in 500 cc.] are added, and the mixture evaporated almost to dryness. The residue is treated, under constant trituration, with 50 cc. of alcohol of 96% by volume, the mixture, while being stirred, raised to boiling on the water-bath, and the solution, after being somewhat cooled, poured through a filter. The residue is treated with 3 successive portions, each, of 50 cc. of the same alcohol, so that the united filtrates shall measure 200 cc. Of this amount 150 cc. are distilled off, and the remainder is evaporated on the water-bath to a viscid consistence. The residue is dissolved in or treated with 10 cc. of absolute alcohol, the solution transferred to a bottle provided with a tight stopper, 15 cc. of ether gradually added, and the whole well mixed. When the layers have separated completely, the layer of ether-alcohol, which must be filtered if necessary, is cautiously evaporated in a thin small bottle, the glass stopper of which is laid aside, until the residue in the bottle ceases to flow readily to and fro. The bottle is then heated for another hour in a steam drying oven, stoppered, and when cold weighed. The process yields results which do not differ more than four per cent. from the true amount. In some of the authors' experiments, the approach to the actual quantity was much closer, but the authors expressly add that the glycerin thus obtained must not be regarded as perfectly pure.—Amer. Drugg., March 1886, 52; from Rep. d. Anal. Chem., 1886, No. 1.

Referring to the above, Mr. C. Amthor draws attention to some discrepancies liable to occur in the absence of certain precautions, and recommends the following modification :

100 cc. of the wine are mixed with 3 grams of caustic lime and with 10 grams of coarse quartz-sand previously washed with hydrochloric acid and ignited. The mixture is then evaporated, being stirred towards the end, so that it may assume a granular appearance. When dry, the mass is loosened as much as possible with a knife—the capsule being placed upon a large sheet of paper—then well mixed with a pestle, and transferred into the extraction apparatus.

The capsule is scoured with 15 drops of distilled water, and this liquid also transferred to the extractor. The last portions of it are washed into the extractor with 2 cc. of 90 per cent. alcohol. 30 cc. of 90 per cent. alcohol are placed into the flask, the extraction apparatus put together, and the extraction accomplished by heating during six hours under an upright condenser. After allowing to stand over night, the extracted mass is treated with three successive portions of 5 cc. each of absolute alcohol, in order to wash down any glycerin that may have become vaporized during the cooling. In this manner about 40 cc. of liquid are obtained, which are evaporated on the water-bath to 20 cc. 30 cc. of ether are then added, and the mixture set aside over night. The clear solution is then poured off, the residue washed with 5 cc. of the same mixture of alcohol and ether, and the ethero-alcoholic solution evaporated in a small flask having a long neck, and which may be closed with a ground stopper. This evaporation or drying should continue precisely two hours in a drying oven at a temperature of 100° C. (212° F.). The weight of the ash [ascertained from a previous experiment, or ascertained from the residue, re-dissolved and re-obtained by evaporation in a crucible] is to be deducted. It is necessary to have some uniform standard for the size and shape of the flask. The author recommends to use a flask of 100 cc. capacity, with a neck 10 cm. (4 inch.) long, and 1.5 cc. ($\frac{1}{16}$ inch) internal diameter.—*Amer. Drugg.*, May 1886, 85.

Glycerin—Determination.—Messrs. William Fox and J. A. Wanklyn have worked out a method for the determination of glycerin, which is based on the fact that glycerin, oxidized with permanganate of potash in a strongly alkaline solution, gives oxalic acid according to the equation $C_3H_8O_3 + O_6 = C_2H_2O_4 + CO_2 + 3H_2O$. The authors carry out the process as follows: An aqueous solution of glycerin (which should not contain more than 0.25 gm. $C_3H_8O_3$) is made strongly alkaline by adding 5.0 gms. of solid caustic potash; powdered permanganate of potash is then gradually added until the solution is of a permanent pink color; the solution is now kept at boiling point for half an hour, and then the excess of $K_2Mn_2O_8$ decomposed with sulphurous acid, either in solution or the gas may be used. The solution, which should now be colorless, is filtered

from the precipitated oxide of manganese, and made acid with acetic acid and boiled; a lime salt is added, and the resulting oxalate collected on a filter and thoroughly washed with boiling water. As the precipitate is not pure oxalate of lime, we determine the oxalic acid in the lime salt by titrating with standard $K_2Mn_2O_8$ in the usual way; with a moderate amount of care this process is very accurate. The difference in several experiments should be under a half per cent., and Messrs. Benedikt and Zigmondy, since the authors have suggested the process, have obtained very satisfactory results, which they publish in the "Moniteur Scientifique Quesneville," vol. xv., October, 1885.

In the saponification of fats in which it is proposed to estimate the glycerin, care should be taken to have the whole of the alcohol driven off, as dilute alcohol treated with alkaline permanganate gives oxalic acid. It may be mentioned that the acids of the acetic series do not oxidize to oxalic acid with alkaline permanganate, whilst those acids of the acrylic series do.—Chem. News, January 8, 1886, 15.

Glycerin.—Effect of an alkaline solution to dissolve *Oxide of Antimony*, which see under "Inorganic Chemistry."

Trinitrine—*Synonym for Nitroglycerin*.—According to a note in Pharm. Jour. and Trans. (May 1, 1886, 919), the word "Trinitrine" has been adopted on the continent of Europe in prescriptions as a synonym for nitroglycerin, in order that in unusually legible (! Rep.) prescriptions the patient may not be alarmed by reading the word nitroglycerin.

Nitroglycerol—*Characters, etc.*—Mr. Hay reviews the chemical relations of nitroglycerol, and concludes with a description of its physical characters. The author has prepared it in a state of purity, and finds that it is perfectly colorless, and remains so even when exposed to air. It keeps equally well in water or alcohol. Heated on the water-bath no change occurs, unless acids or alkalis are present.

1 gram of nitroglycerol dissolves in 800 cc. water; in 3 cc. alcohol; in 10.5 cc. alcohol (sp. gr. 0.846); in 1 cc. methyl alcohol (sp. gr. 0.814); in 4 cc. methylated spirit (sp. gr. 0.830); in 18 cc. amyl alcohol; in less than 1 cc. benzin; in 120 cc. carbon bisulphide; in all proportions of ether, chloroform, glacial acetic acid, and phenol; and sparingly in glycerol.

Nitroglycerol can be estimated with tolerable accuracy by determining the amount of nitrate formed by boiling with alcoholic potash, and assuming that 100 parts of nitroglycerol yield 33.48 parts of nitrous anhydride.—Jour. Chem. Soc., 1885, p. 742; Trans. Roy. Soc., Edinb., vol. 32.

Nitroglycerin—*Effect upon Albuminous Urine*.—Dr. Burzhinski has observed that when nitroglycerin is given in small doses, it has the effect of diminishing the quantity of albumen eliminated in twenty-four hours,

while it increases the quantity of urine, the increase being maintained for some time after the use of the drug is discontinued. The only deleterious effect observed during its use was a slight transient headache during the first days of employment.—*Pharm. Jour. and Trans.*, Oct. 31, 1885, 367; *Lancet*, Oct. 17, 1885, 733.

Nitroglycerin—Value in Hiccough.—Nitroglycerin has been successfully employed by Dr. O. T. Shultz, of Mount Vernon, Ind., in a severe case of hiccough. One drop of a one per cent. solution of nitroglycerin was given every hour at first, the time being gradually extended. On the second day after commencing this treatment permanent relief was obtained.—*Amer. Practitioner*, 1885; *Amer. Jour. Pharm.*, March 1886, 156.

FIXED OILS.

Fixed Oils—Methods of Examination.—Mr. Alfred Allen contributes a lengthy paper on the methods of examining and the chemistry of fixed oils, embracing their specific gravities, coefficients of expansion, viscosity, bromine and iodine absorption, the acetic acid test, determination of glycerin, and the products of saponification. The various tables given by the author embrace nearly all the fixed oils and fats known to commerce.—*Jour. of the Soc. of Chem. Industry*, Feb. 27, 1886.

Fixed Oils—Specific Gravities.—Mr. E. Dieterich has determined the specific gravity of a number of fixed oils in a pure condition, at the temperature 23° C. (73.4° F.) The following are the results:

Olive oil (Provence).	0.912–0.914
“ green	0.909–0.915
Sunflower-seed oil.	0.920
Cotton-seed oil	0.917–0.921
Peanut oil	0.917–0.918
Rape oil.	0.913
Sesame oil	0.919
Castor oil	0.964

—*Amer. Drugg.*, Feb. 1886, 29; from *Dingl. Polyt. Jour.*, 1885.

Oils and Fats.—Ability to dissolve *Biniiodide of Mercury*, which see under “Inorganic Chemistry.”

Stearic Acid.—Use in *Ointments*, which see under “Pharmacy.”

Oleic Acid—Examination.—Mr. L. H. Schulmeyer has examined four samples of oleic acid—the fourth in the order having been prepared in the laboratory of Purdue University with the following results:

	Specific gravity.	Vol. of normal NaOH required.	Percentage of oleic acid.
No. 1.	.91	31.8 cc.	87
No. 2.	.89	28.6 “	81
No. 3.	.88	22.4 “	63
No. 4.	.90	35.1 “	99

Theory requires 35.4 cc. of normal NaOH. Solution in alcohol gave no indication of fixed oils, but the samples were not free from palmitic acid, especially No. 3, which still had the odor of lard oil.—*Amer. Jour. Pharm.*, May 1886, 225, 226.

Oleates—Preparation, etc.—Mr. L. H. Schulmeyer has made experiments upon oleates both by direct combination and by double decomposition. He finds that the oleates made by double decomposition keep very well if carefully made, but the method by direct combination is recommended, as it takes less time and care. The soap solution necessary for making oleates by double decomposition is best made by taking a good quality of oleic acid and adding just enough solution of sodium hydrate to saponify it, the slight excess of sodium hydrate being neutralized with tartaric acid. It is best to use this solution rather dilute, about eight ounces of water to one ounce of oleic acid.

Oleate of Mercury was made by direct combination, both with the red and the yellow oxide of mercury and with and without heat. Under any condition this oleate does not keep well, but that made without heat keeps best. The oleate was also made by double decomposition. The red oxide of mercury was dissolved in excess in dilute nitric acid by boiling, filtering out the solution of mercuric nitrate, and then slowly adding it to a filtered solution of soap with constant stirring. The solution becomes milky, then a precipitate begins to fall; the mercuric nitrate is added until the solution becomes very nearly clear again, this leaves a slight excess of the soap in solution. The precipitate is now washed with warm water and dried. Thus prepared, it is of a light yellow or cream color, very nearly white, of a rather stiff consistence and contains 28 per cent. of oxide of mercury. It keeps very well. A 10 per cent. oleate of mercury made from this differs somewhat in appearance, from the other, having a much clearer yellow color, while those that are made by combining the oxide of mercury and oleic acid have a whitish milky appearance. The other officinal oleates can best be made by precipitating the soap solution with some soluble salts, as sulphate of copper, acetate of lead, acetate of zinc, etc.

Oleate of Arsenic is most likely only a name for a solution of slight traces of arsenic in soap, as the author has been unable to make an oleate by the different methods published.

Oleate of Veratrine is the only other officinal oleate, and it, as well as the other oleates of alkaloids, are easily made by simply dissolving the alkaloids in the acid.—*Amer. Jour. Pharm.*, June 1886, 284-286.

Oleates—Formation during the Preparation of Certain Officinal Ointments.—Mr. Charles T. George has made a series of experiments which tend to show that in the preparation of mercurial ointment, ointment of red and yellow oxide of mercury, of nitrate of mercury, and of oxide of

zinc, a certain proportion of oleate is formed, and, believing that the formation of these oleates is necessary to the proper medicinal activity of the ointments under consideration, he advises against the substitution of pretrolatum for the officinal ingredients, since no combination takes place with any portion of the last named body.—Proc. Penn. Phar. Assoc., 1886, 214-217.

Oleate of Manganese—Preparation.—Mr. C. E. Kreyssler has prepared oleate of manganese as follows: A solution of castile soap (which the author considers a sufficiently pure solution of sodium oleate) is poured with constant stirring into a solution of sulphate of manganese. A granular precipitate of oleate of manganese is at once formed, which upon gently heating, is changed suddenly into a sticky mass, having the consistence of putty. When freed from sulphate of sodium by washing several times with warm distilled water, the oleate is obtained in the form of a hard substance having a light grey, slightly pinkish color, a sweet musty taste, and peculiar odor. It is sparingly soluble in alcohol, but readily in ether, chloroform, olive oil and oleic acid. The author states that it is employed in 20 % solution, but does not mention the solvent.—Amer. Jour. Phar., July 1885, 369-370.

Oleate of Zinc—Preparation and Properties.—Prof. T. J. Wrampelmeier finds that two forms of oleate of zinc are met with in pharmacies, the first being a soft solid, of the consistence of tallow, and evidently only containing a certain percentage of true oleate; the second being a soft, white powder, presumably the true oleate. The latter should contain 12.9% of zinc. Three specimens examined contained 11.2, 13.6, and 15.5% zinc oxide respectively, whilst two samples of the former (soft kind), contained 4.1 and 6.9% respectively. The author recommends the process of Mr. Parsons as the simplest, which will be found in Drugg. Circ., Jan., 1885, and consists in precipitating a solution of castile soap with a solution of acetate of zinc. Sulphate of zinc is sometimes employed for this purpose, but has the objection that the resulting sulphate of sodium is very difficult to wash out of the precipitate. The oleate of zinc properly prepared constitutes a soft, white powder. To make the 5% oleate, used as ointment, five parts of the powder should be triturated with eight parts of oleic acid. It should be made extemporaneously.—Proc. Mich. State Pharm. Assoc., 1885, 134-136.

Oleate of Copper—A Remedy for Corns.—For corns oleate of copper spread as a plaster is recommended in "St. Louis Med. Jour." This has probably a similar effect to the ceratum æruginis of German pharmacy which contains 5 per cent. of verdigris, while some old formulas directed as high as 15 per cent.—Amer. Jour. Pharm., Sept. 1885, 450.

Oleate of Arsenic—Indefinite Character.—Prof. Theo. J. Wrampelmeier, following the process of Mr. Parsons (Drugg. Circ., Jan. 1885)

has obtained an oleate of arsenic, so-called, which, like two samples of oleate of arsenic purchased from manufacturing firms, is evidently an admixture of arsenious acid with oleic acid. The author expresses the opinion that a true oleate of arsenic is incapable of existence, and that the products so called must necessarily vary according to the variation in the process of this preparation.—Proc. Mich. State Pharm. Assoc., 1885, 137-139.

Sulpholeates—Preparation and Uses.—Mr. A. Convert draws attention to the sulpholeates which are now largely used for various technical purposes, such as mordant for turkey-red, emulsionizing agent for benzin, bisulphide of carbon, ether, volatile oils, etc., to produce a bead on alcoholic liquors, etc., etc. Their preparation (from almond, ricinus, or other fixed oil) is as follows: The oil is carefully and gradually mixed with 30-40 parts of concentrated sulphuric acid, the mixture being cooled if necessary with ice, to prevent a rise of temperature above 50° C. The reaction, which at first is quite violent, is allowed to go on for 6 to 12 hours, after which the mixture of acid and glycerin is drawn off, the residue mixed with 100 p. of water, and this, after stirring, is also drawn off. The resulting sulpholeic acid is converted into

Alkaline Sulpholeate, by addition of caustic or carbonate of the required alkali. From this combination pure sulpholeic acid is obtained by careful decomposition with sulphuric acid, and agitation with benzin or ether, which leaves the acid on evaporation pure and anhydrous.—Pharm. Rundschau, July 1885, 154.

Sulpholeates—Characters, etc.—Dr. A. Müller-Jacobs, referring to the paper of Mr. Convert, communicates some additional information respecting the character of the sulpholeates which, he considers, are destined to become important additions to technical pharmacy. After describing the methods for the preparation of the acid from such oils as olive oil, rape-seed oil, almond oil, fish-oils, castor oil, etc., he describes in a general way the sulpholeates of the alkalies and of the alkaline earths, and mentions numerous substances for which they readily act as excellent solvents. He concludes his paper by describing the numerous uses to which the sulpholeates have been applied, as well as some for which they appear to be eminently suited.—Pharm. Rundschau, 1885, Aug. (p. 174), Sept. (p. 202), Dec. (p. 267), and 1886, Jan. (p. 4).

Morrhual—Source and Characters.—Under the name of "morrhual," a product has been introduced into the market as representing the active principle of cod-liver oil. It is said to be obtained by treating cod-liver oil with an aqueous solution of bicarbonate of sodium, or by shaking the oil with 90% alcohol, decanting the alcoholic liquid, and distilling, the morrhual being left in the retort. It is described as an acrid, bitter liquid, very aromatic, crystallizing partially even at ordinary temperature,

and containing a considerable quantity of phosphorus, iodine, and bromine, in a peculiar form of combination. The yield is said to vary with the kind of oil; brown oil yielding 4 to 6 per cent. of its weight, pale oil 2.5 to 3 per cent., and colorless oil 1.5 to 2 per cent. It is recommended to be administered in capsules containing 0.20 gram as being equal to 5 grams of oil.—Pharm. Jour. and Trans., Jan. 30, 1886, 643; Rép. de Pharm. Jan. 1886, 9; Pharm. Post, Jan. 16, 1886, 43.

Lard—Occurrence and Source of Gelatinous Matter.—The question has been raised, whether the occurrence of gelatinous matter in lard is to be taken as evidence of adulteration. It has, however, been pointed out that a large portion of what is sold as lard in commerce, rather deserves the name of pork drippings, since American manufacturers melt down the whole available fat of the pig, and Mr. W. Brown, who claims to have had a large experience, attributes the formation of gelatinous matter to the action during the refining process of alkali upon the fatty tissue left in the lard. The solidifying points of commercial lards fall sometimes as low as 78° F., but Mr. Brown points out that when such lards are submitted to pressure, the temperature of solidification rises in direct ratio to the pressure until the solidifying point of stearin is reached. The oil thus expressed is ordinarily used as a lubricant, but being perfectly sweet in odor and taste when freshly prepared, it would be much more economically employed in the preparation of food.—Pharm. Jour. and Trans., Oct. 31, 1885, 368; Chem. News, Oct. 16 and 23, 1885.

Butter—New Method of Examination.—Mr. Morton Liebschütz proposes a method for the examination of butter, which is based upon the saponification method by means of barium hydrate of David (Compt. Rend., 1882).

The sample of butter, so-called, is first melted in the air bath at 70° C. The clear fat rising above the water, salt and other impurities, is decanted through a small dry filter, placed in a warm funnel, and the filtrate is collected in a small dish. About 20 grams are taken, allowed to cool, and weighed, together with a small spatula. Ten grams are removed and placed in a porcelain capsule of about 50 cc., heated on a steam or water-bath, and when the fat is very warm 20 grams of barium hydrate (9 mols. water) are added. When the emulsion has formed, pour in 30 cc. of hot alcohol at 90° C., stirring briskly until the mass is nearly dry.

Add 200 cc. of cold water; break the mass of barium soap with the spatula, and boil to reduce the liquid to one-half. Cool for a time, decant through a linen filter, repeating the boiling and the decantation three times at least; then, finally, throw the whole contents of the capsule upon the filter, after dividing the soap finely with a small pestle. Wash the filter with a few cc. of water, and squeeze it with the fingers.

Evaporate all of the solutions to about 100 cc.; add litmus, and neutralize cautiously with dilute sulphuric acid. Neutralize the slight excess of acid with barium carbonate. Filter the solution, wash the filter, and evaporate the liquor to a syrupy consistency.

As has already been said, the glycerin so obtained is not pure. Treat the contents of the capsule with strong alcohol; a large quantity of salts is thrown down. The alcoholic solution is filtered through a small filter, previously moistened with alcohol, and the filtrate is collected in a tared platinum or porcelain dish. Evaporate the alcohol on the water-bath, and dry in the air-bath above 100° C. to constant weight. After noting this, heat the glycerin and burn it. The weight of the ash is deducted from the total weight; the difference is glycerin. The percentage of ash compared with the total percentage of glycerin is by itself an important factor, as glycerin derived by this mode of treatment from pure butter gives 5 per cent. of ash, whereas the glycerin of oleomargarine and other similar fats leaves only from 0.3 to 0.6 per cent. By this method the author found, after deduction of ash, 3.75 per cent. glycerin in pure butter; 7 per cent. glycerin in oleomargarine.—*Amer. Jour. Phar.*, Aug. 1885, 401-403; from *Jour. Amer. Chem. Soc.*, 1885.

Olive Oil—Test for Foreign Oils.—Mr. Audouinaud recommends agitating 2 cc. of the oil with 0.1 gm. of powdered potassium bichromate; after a few minutes sufficient nitroso-sulphuric acid to make 4 cc. is added and the brown-red mixture agitated; on the addition of 1 cc. of ether pure olive oil rises to the surface with a green color. In the presence of 5 per cent. or more of the oil of sesame, ground-nut, cotton seed or poppy seed, the color of the oily layer varies from yellowish-green to yellow or reddish-yellow; the addition of water makes the color more apparent.—*Amer. Jour. Pharm.*, Feb. 1886, 91; from *Rép. d. Pharm.*, 1885, 498.

Cotton Seed Oil—Commercial Character, etc.—Mr. W. Gilmour has subjected cotton seed oils, as found in British commerce, to critical examination. He found no two samples to agree exactly, and that therefore, any observations on individual samples are practically useless. Thus, two samples, which he regards as typical, are distinguished from each other by the one readily forming an emulsion with alkalies, separating more or less after a time, whilst the other utterly refuses to form an emulsion of any kind. Cotton seed oil, he thinks, is admirably adapted as a base for ointments and pomades, but is not suited for forming liniments with alkaline solutions.—*Yearbook of Pharm.*, 1885, 398-401.

Apricot, Peach and Walnut Oils—Chemical Examination.—Mr. Thos. Maben has examined the fixed oils of apricot, wild peach and walnut. These oils are comparatively little known in western Europe, but are extracted on a large scale in the more temperate belt of Asia between East Hindostan and Persia, the particular specimens under consideration being

from the Punjaub. The *oil of apricot* is known in the Punjaub under the name of "chooli-ki-tel," and is sold also in the bazaars as "badam kohee." It is extracted from the kernels of *Prunus Armeniaca*, is clear, of a pale yellow color, a shade darker than almond oil, has a distinct odor of hydrocyanic acid, and has a bland taste, with a mild amygdalaceous flavor. While Cooke says that it contains about 4 per cent. of hydrocyanic acid, the author is strongly of the opinion that the percentage will be generally less than this. The

Oil of Peach, which goes by the native name of "beemi-ki-tel," is expressed from the kernels of *Prunus (Amygdalus) Persica*. It is not unlike that from the apricot in appearance, but a shade darker. The sample under examination showed slight fluorescence, which may, however, be accidental. Its odor is strong of hydrocyanic acid, and its taste disagreeable, both being more decided than in the case of apricot oil. The

Oil of Walnut, which is known as "akrot-ki-tel," is extracted with or without heat from the kernels of *Juglans regia*. In appearance it resembles almond oil even more closely than the others, but being a drying oil, can be used neither as an adulterant of or substitute for almond oil. It has a nutty odor and a disagreeable almost acrid taste, the latter being particularly the case when it is prepared by heat, the cold-drawn oil being by no means disagreeable.

The author's results of the chemical examination of the three oils are summarized in the following table; a comparison being also made with almond oil, which is said to be adulterated at times by the one or the other of the two first mentioned oils.

	Apricot Oil. (Non-drying.)	Peach Oil. (Non-drying.)	Almond Oil. (Non-drying.)	Walnut Oil (Drying.)
Sp. grav. at 60° F.	0.9204.	0.9232.	0.9180.	0.9264.
Freezing point . .	Slightly viscid at —20° C.	Slightly viscid at —20° C.	Opaque and vis- cid at 20° C.	Viscid and slightly opaque at —20° C.
Saponification 1000 parts of oil re- quire parts KHO.	181.4.	189.1.	183.0.	194.4.
Bromine absorp- tion, 100 parts of oil absorb parts Br.	70.0.	77.0.	53.74.	90.5.
Action of nitric acid	Coffee-brown color.	Dark-brown color.	Action slight.	Dark-brown color.
Action of sulphuric acid	Light brown to red brown.	Dark-brown.	Yellow to orange.	Dark-brown to purple.
Action of chloride of zinc solution.	Muddy-brown with purple shade.	Purple-brown.	No action.	Muddy-brown.
Elaidin test . . .	Light-yellow, hard.	Citron-yellow, soft.	White, hard.	Does not solidify.

Oil of Maize.—Separation from *Indian Corn* or *Maize*, which see under “*Materia Medica*.”

Castor Oil—*Use for Removing Warts*.—Dr. S. C. Dumm recommends castor oil for removing warts; the application is made once a day, and must be continued for from two to four or six weeks.—*Amer. Jour. Pharm.*, Feb. 1886, 104; from *Therap. Gaz.*, Dec. 1885.

Linseed Oil—*Bleaching*.—According to the “*Independent Journal*,” linseed oil may be bleached by the following process: Introduce about 18 pounds of the oil into a 6 gallon bottle or uncovered carboy, and add about 10 pints of a solution of 100 parts of sulphate of iron (copperas) in 150 parts of soft water. Then expose the vessel to direct sunlight, and shake the contents, at least once a day, thoroughly. The rate of bleaching depends on the temperature and intensity of sunlight. In place of the sulphate of iron, sulphate of lead may be used. For 100 parts of oil, 2 parts of lead sulphate are taken, first intimately mixed with a little of the oil, and then with the remainder.

Oil of Perilla ocymoides—*Uses, etc. in Japan*.—Mr. E. M. Holmes draws attention to this drying oil, which is extensively used in Japan, though it is not as siccative as the so-called Japanese wood oil (see *Proceedings* 1885, 283). It is obtained by pressure from the seeds, which yield about 40 per cent. of their weight. The seeds are greyish-brown, and about the size of a millet seed. The oil is used to water-proof clothing and paper used for parasols, and is used as a kind of a lacquer or with lacquer to give brilliancy and transparency. Insects do not attack materials prepared with this oil. The plant producing the seeds is very common in many provinces of the Isles of Nippon and Kiusiu, and is also much cultivated.—*Pharm. Jour. and Trans.*, Feb. 20, 1886, 702.

Coccerin.—A peculiar wax present in *Cochineal*, which see under “*Materia Medica*.”

CARBOHYDRATES.

• *Carbohydrates*—*Color Reaction with Phenols*, which see, page 561.

Gums—*Formation in Trees due to the Action of an Unformed Ferment*.—Some time since Dr. Beijerinck made a series of investigations into the cause of the formation of gum in trees, which led him to believe that it is due to pathological changes brought about by the influence of a fungus. Working independently, and in ignorance of Dr. Beijerinck’s researches, Dr. Wiesner has now arrived at similar conclusions, attributing however the formation of gum to the action of an unformed ferment. This ferment he considers to belong to the starch-converting or diastatic enzymes, but to differ from the ordinary members of this group in that, whilst it converts starch into dextrine, it produces no sugar reducing Trommer’s solution. The presence of this ferment was first suspected from the fact

that solution of gum arabic treated with tincture of guaiacum gives a blue color, like that given by diastase and some other unformed ferments when similarly treated. This character has, in fact, been put forward as a means of distinguishing an admixture of gum arabic in gum tragacanth, but the author finds that it is common to nearly all cerasin and arabin gums as well as to tragacanth. Upon boiling the gum solution this property disappears. The diastatic character of the gum ferment was inferred from its behavior in preventing or limiting the iodine reaction on starch paste. From diastase the ferment is distinguished by its behavior when even a one per cent. solution of gum containing it is boiled with orcin and hydrochloric acid. The mixture becomes red, then violet, and deposits a deep blue precipitate, whilst in the case of diastase the mixture becomes red and deposits a brown precipitate without passing to violet. Dr. Wiesner enumerates a large series of gums, and of gum containing substances, such as linseed, quince seed, etc., in which this ferment can be demonstrated. The seat of development of the gum ferment appears to be the granular protoplasmic matter of the parenchyme cells. From thence it attacks the cellulose of the cell walls, converting it into gum or mucilage, in the latter case disappearing itself from the finished product. The ferment probably converts any starch it may meet with, into dextrin, though never into a reducing sugar; indeed it seems capable of arresting the action of diastase in this direction, when added to a solution of dextrin containing diastase.—*Monatshefte*, vi. 592; *Phar. Jour. and Trans.*, Oct 3, 1885, 285.

Algin—Additional Characters.—Mr. E. C. C. Stanford gives some further information respecting the gum like substance *algin* (see *Proceedings* 1883, 243) or *alginic acid*, which he has separated from sea-weed. Further analyses have led him to the conclusion that the formula by which he at first represented the acid requires to be doubled, and that it should be $C_{76}H_{100}N_{22}O_{22}$. There appears to be a remarkable relationship between this body and albumen, but none between it and the pectin compounds, even if it were non-nitrogenous. The soluble alginates, sodium, potassium, ammonium, lithium, have all an acid reaction. Some of the insoluble alginates are very soluble in ammonia, with which they appear to form double salts. Shellac is dissolved by the alkaline alginates, the brown ammonium solution, when evaporated, forming a thin tenacious film, quite soluble in water, but which after being passed through a bath of dilute hydrochloric acid is insoluble. The compound then resembles sheet gutta percha, and it is thought might replace that substance for surgical dressings.—*Phar. Jour. and Trans.*, May 29, 1886, 1005; *Jour. Soc. Chem., Ind.*, April 29, 1886, 218.

Algin—Preparation, etc., from *sea weeds*, which see under “*Materia Medica.*”

Agar-agar—Varieties.—Mr. Fristedt classifies the varieties of agar-agar, as follows:

1. *Ceylon Agar-agar*, consisting chiefly of *Sphærococcus lichenoides*, Ag., the alga used by the *Hirundo esculenta* in the formation of its edible nest.

2. *Macassar Agar-agar*, coming from the straits between Borneo and the Celebes Island, consisting of impure *Eucheuma spinosum*, incrustated with salt.

3. *Japanese Agar-agar*, known as Japanese isinglass, derived from several algæ, especially *Sphærococcus compressus*, Ag., *Gloiopeltis tenax*, J. Ag., *Gelidium corneum*, Lam., and *G. cartilagineum*, Gaill., which occurs in European commerce either in transparent pieces, 2 feet long and as thick as a straw, prepared in Singapore by sticking the algæ named in hot water, or more frequently in yellowish-white masses, a foot long and upwards of an inch in width. It is the latter kind that is suitable for the purpose of bacteric culture according to Koch's method.—Pharm. Zeit. Aug. 22, 1885, 643; Pharm. Jour. and Trans., Aug. 29, 1885, 188.

Cane Sugar—Influence of Neutral Salts and of Temperature on its Inversion by Acids.—Mr. J. Spohr, in continuation of former experiments, finds that when the relation between the amount of acid and water present is constant, but the amount of cane sugar variable, different weights of sugar are inverted in equal times. The intensity of the inverting action of hydrochloric or hydrobromic acid always increases with the amount of neutral salts added, this increase being greatest when the neutral salt is in relatively large proportion. If the amount of acid present is constant, the increase of the rate of inversion is directly proportional to the amount of the neutral salt added. The amount of the neutral salt present being constant, the intensity of the inverting action of the acid varies directly with its concentration. In the case of acids similar to hydrobromic acid, the percentage of alteration of the rapidity of the inversion caused by the addition of a neutral salt, depends only on the quantity of the added salt, and is independent of the concentration of the acid. The results obtained by the author with hydrochloric acid are similar to those obtained with the hydrobromic; but the laws according to which the intensity of the inverting action of sulphuric acid is affected by the concentration of the acid and presence of the neutral salts, are much more obscure than is the case with the monobasic acids.—Jour. Chem. Soc., June 1886; from Jour. Pract. Chem. (2), xxxiii, 265-284.

Sugar—Preservation of its Solutions for Testing.—Mr. W. Ostwald, having occasion to preserve liquids containing sugar, for some time, with a view to systematic investigation, resorted to a number of expedients to overcome the difficulty. The ordinary antiseptics, such as corrosive sub-

limate, phenol, etc., were inapplicable, as they either produced a special inverting effect themselves or entered into some reaction with certain acids to be added. Indifferent substances, such as carbon disulphide and chloroform, suffered gradual decomposition in the sugar solution, rendered it turbid, and produced decomposition products showing inversion. The only two substances finally found which prevented any change were camphor and petroleum.

The author obtained the best results by placing some lumps of camphor in the liquid to be preserved, and soaking the stopper used for closing the flask in petroleum.—*Journ. Prakt. Chem.*, 1885, 308.

Caramel—Detection in Liquors.—Mr. J. H. Long communicates the results of a series of experiments made with a view to testing the reliability of tests for caramel in liquors. His results seem to show that most of the processes are incomplete or faulty, and that at the present time we have no certain test for the presence of added caramel in liquors.—*The Pharmacist*, Aug. 1885, 233-235.

Caramel—Astringent Properties—Mr. A. Convert draws attention to the fact that caramel possesses marked astringent properties. He has found it to be efficient in catarrhal affections of the intestinal canal, and that it does not produce any unpleasant after-effects. The commercial article being of variable and uncertain composition, the author recommends its preparation by pharmacists. Pure cane sugar, being slowly heated in an iron pan at 200° C. until the mass has assumed a deep brown-black color, and a drop, allowed to cool, forms a brittle mass. An equal quantity of warm water is then slowly added, and a moderate heat continued until solution is effected. If desirable, the water can be omitted, and the dry caramel, which is quite hygroscopic, may be rapidly reduced to powder and preserved in small, well-stoppered vials. The dose of this powder is from 2 to 4 grams.—*Pharm Rundschau*, Aug. 1885, 175.

Formose—A Synthetically Prepared Sugar.—Since the discovery of Butterow, in 1861, that a body nearly allied to the sugars, which he named "methylenitan," could be formed from formaldehyde through condensation with hydrated lime, many experiments for the synthesis of a sugar from formaldehyde have been made. Apparent success has now been obtained by Mr. O. Loew. He states that upon treating a solution containing 3.5 to 4 per cent. of formaldehyde with slight excess of milk of lime for half an hour, with frequent shaking and then filtering, condensation goes on in the filtrate until after five or six days the smell of formaldehyde has disappeared, when the liquid energetically reduces Fehling's solution. It is then neutralized with oxalic acid, concentrated to a thin syrup, mixed with an equal volume of strong alcohol, and kept at a gentle heat for several hours, during which formate of calcium crys-

tallizes out. After filtration it is further concentrated, dissolved in several times its volume of alcohol, and ether added, which precipitates the sugar as a viscous mass. After purification by fractional precipitation by absolute alcohol, the sugar, which the author has named "formose," is obtained as a gummy mass, having a composition represented by the formula $C_6H_{12}O_6$. Formose is intensely sweet; when dry it is only slightly soluble in absolute alcohol, and almost insoluble in ether. At a temperature of $120^\circ C$. it loses a molecule of water, and is converted into a bitter substance. In contact with alkalis also it rapidly undergoes change. The author supposes that Butterow's methylenitan was a mixture of formose with decomposition products.—Pharm. Jour. and Trans., May 29, 1886, 1008; Jour. f. Prakt. Chem., xxxiii. 321.

Saccharin—Character, etc.—This interesting substance, which has recently attracted notice both in Europe and America, is the subject of a paper by Mr. J. G. Adami, in which he reviews its character, and the uses to which it is likely to be applied. He observes that it is to be regretted that the name "Saccharin" should have been given when the substance is not a carbohydrate but a nitrogenous body, having no affinities to the sugars proper save in the peculiar quality of sweetness, and when again the term saccharin has already been employed by Peligot to designate a dextrogyrous sugar obtained by the prolonged heating of a solution of glucose with lime. The saccharin prepared by Fahlberg of New York is made from toluene, and has the formula $C_6H_4 \begin{smallmatrix} CO \\ SO_2 \end{smallmatrix} NH$ being anhydro-ortho-sulphamin-benzoic acid, or benzoyl-sulphonic-imide. It is a white crystalline substance, difficultly soluble in cold water, more easily in hot, crystallizing out on cooling in short, thick prisms, apparently monoclinic. According to Aducco and Mosso, the aqueous solution is strongly acid. Saccharin melts at $200^\circ C$., partially decomposing and giving off the smell of bitter almonds.

Even when the amount present is so small as one part in 70,000 of water, the neutralized solution has a distinct sweet taste—as sweet, that is, as that of one part of cane or beetroot sugar in 250 parts of water; so, therefore, saccharin would seem to possess 280 times the sweetness of ordinary sugar. Alcohol, ether, and glucose are good solvents, and it is precipitated out of the neutralized solution by hydrochloric acid. Its salts also possess a strongly saccharine taste.

Aducco and Mosso, studying the physiological action of this body, found that frogs could be kept for days, and with impunity, in a neutralized watery solution. Dogs also exhibited no ill effects when saccharin was given in increasingly large quantities up to 5 grams daily for several days. The body-weight continued unaltered. The saccharin was discovered unchanged in the urine; it seems to undergo no change in the body. It does not influence the quantity or specific gravity of the urine,

nor does it cause any change in the urea and sulphuric acid excreted; the chlorides are slightly increased. The presence of saccharin in the urine delays decomposition.

Stutzer, as well as Aducco and Mosso, obtained similar results in the human subject, 5 grm. daily having no ill effect, passing away by the kidneys and appearing neither in the saliva, nor in the milk, nor in the fæces; the appetite remained unaffected. Now 5 grm. of saccharin, it must be noted, are equal in sweetening power to more than two and a half pounds of sugar.

From this it will be seen that Fahlberg's saccharin may become, in certain cases, a useful substitute for sugar. In diabetes, Dreschfeld has determined no alteration either in the quantity of urine or in the amount of sugar passed. According to Levinstein, diabetic patients in Berlin have been treated with it for several months, without experiencing any ill effects. Its use is further indicated in obesity. Saccharin has scarcely any retarding effect on the digestion of either proteids or hydrocarbons, and in two cases of acid dyspepsia Dreschfeld found that it relieved some of the troublesome symptoms. Stutzer has noticed that when added in small quantities it increases the diastatic action of malt in presence of sugar.

As an indication of other possible uses, it may be remarked that Levinstein, at a meeting of the Society of Chemical Industry, in Manchester, exhibited a specimen of quinine, in which the bitter taste had been masked by the addition of a small quantity of saccharin.—*Med. Chronicle*, April, 1886.

Milk Sugar—Detection of Cane Sugar Present.—The following method was first proposed by Mr. Lorin (*Pharm. Zeitsch. f. Russl.*, xvii., 372), and is now recommended as reliable in "*Pharm. Centralh.*" (No. 22, 1885). If a mixture of equal parts of oxalic acid and sugar of milk be warmed over the water-bath, the mass melts and assumes a faintly darker coloration on being heated for some time. In case the mixture contains but one per cent. of cane sugar, it darkens very rapidly, changing from greenish brown to black in the presence of a larger percentage of cane sugar.—*Amer. Jour. Pharm.*, Aug. 1885, 383.

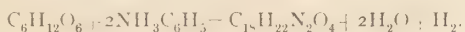
Milk Sugar—Estimation in Presence of Cane Sugar.—The method of A. W. Stokes and R. Bodmer is especially adapted for milk, and requires an ammoniacal Fehling's solution, prepared as follows: Dissolve crystallized sulphate of copper 34.65, Rochelle salt 170, liquor potassæ 170, in sufficient water to make one liter. To 120 cc. of this solution add 400 cc. ammonia (spec. grav. 0.880), and dilute to one liter. This ammoniated cupric fluid constitutes the *Pavy solution*, of which 10 cc. correspond to 0.005 gm. of glucose; it is advisable to standardize it with inverted cane sugar. The saccharine liquid or the sufficiently diluted milk is first titrated in the ordinary way. Then another portion of the milk

is boiled with two per cent. of citric acid during ten minutes—which operation inverts all the cane sugar—the liquid when cool may be tritrated. The first result gives sugar of milk alone, the second also the inverted cane sugar, and thus the percentage of both sugars is easily calculated.—*Amer. Jour. Pharm.*, Aug. 1885, 383; from *Analyst*, April. 1885, p. 62.

Glucose—Formation of Alkaloid by Prolonged Contact with Ammonia. See under *Alkaloids*.

Glucose—Stable Reagent.—Mr. F. Creswell recommends a formula for a substitute for Fehling's solution, which he has kept between four and five years without its having lost its sensitiveness as a test for urine-sugar. 35 grams of sulphate of copper are to be dissolved in 200 cc. of glycerin and 100 cc. of water. To this add 80 grams of sodium hydrate dissolved in 400 cc. of water, and boil the whole for fifteen minutes. Then add enough water to make 1 liter, and allow it to stand until it is clear. This may be standardized with a solution of grape-sugar of known strength when required for accurate determinations, and needs to be diluted for use. For rough clinical work, this quantity may be diluted to 1,250 cc., when 10 cc. will reduce 5 centigrams of urine-sugar. In use, 10 cc. are to be mixed with 50 cc. of water and boiled in a small flask, and the solution of glucose (which should not contain more than 1%) is slowly added from a burette during constant boiling, until the blue color has disappeared from the contents of the flask. The quantity of sugar-solution used must then have contained 5 centigrams of sugar.—*Amer. Drugg.*, May 1886, 82; from *Brit. Med. Jour.*

Glucose—Test.—Messrs. Fischer, Jaksch, and Grocco observe that a mixture of 1 part glucose, 2 part phenylamine, 3 parts sodium acetate, forms fine yellow crystals of a substance termed *phenyl glucose-amine*, according to the following reaction:



In a very dilute solution of glucose, in order to recognize the yellow crystals, it is necessary to use the microscope. Jaksch and Grocco have applied the test clinically. A process much practiced is the following: Mix, in a capsule, 1 part of phenylamine, 1.5 parts sodium acetate and 20 parts of urine, heat for twenty minutes upon a salt bath. Cool and let stand for a half hour and examine the precipitate under the microscope. If the urine contains glucose, groups of needle-shaped crystals will be obtained. This method, it is claimed, will distinguish as low as 0.1 gm. or less in 1 liter of urine.—*Annali di Chim. Med. Farm.*, 1885, 507.

Diabetic Sugar—Test.—Prof. Seegen, of Vienna, adopts the following mode of examining urine when diabetes is suspected. The urine is first filtered through *blood charcoal*. The charcoal is then washed repeatedly with distilled water, and the third or fourth washing is tested with Fehling's solution. The blood charcoal retains the substances which

interfere with the reduction of the copper. The first washing sometimes fails to show the presence of sugar, but the third washing always will, if sugar is really present. It is claimed by Prof. Seegen that the use of *blood* charcoal is essential, bone charcoal being inefficient.—Med. Record, Oct. 17, 1885.

Glucose—*New Test for its Presence in Urine*.—Mr. Grocco recommends the following: Pour 40 parts of the urine on a mixture of 2 parts of phenylhydrazin and 3 parts of acetate of sodium, heat in a water-bath during 20 minutes, let settle for half an hour, and examine the sediment under the microscope. If grape-sugar was present, fine yellow crystals of phenylglycosazon will be formed, which are easily detected in dilute solutions. The reaction is said to be reliable, and not disturbed by other constituents of the urine.—Amer. Drugg., Aug. 1885, 156.

Raffinose—*Identity with Melitose*.—Mr. B. Tollens, in a long but interesting article, proves that the saccharine substance described by Loiseau in 1876, under the name of raffinose (see Proceedings 1877, 288), and obtained from the molasses of a sugar refinery, is identical with melitose occurring naturally in *Eucalyptus viminalis* and other species. He has further found that the sugar called

Gossypose, obtained from cotton seed, is also identical with melitose.* This name should therefore take the place of raffinose and gossypose.—Annal. di Chim., ccxxxiii, 204.

Raffinose and Gossypose—*Identity, etc.*—According to Mr. C. Scheibler these two sugars are identical, have the formula $C_{18}H_{32}O_{16} + 5H_2O$, are dextro-rotatory, giving $[\alpha] D = 103.9$, and when inverted by sulphuric acid give identical results. Raffinose seems to exist ready formed in beet root, and not to be generated on storing the root or during the refining process, as appears to be the view of Loiseau, its discoverer (1876). Gossypose was isolated by Böhm and Ritthausen from cotton-seed cake.—Ber. Deutsch Chem. Ges., 1886, 1779-1786.

Cyclamose—*A New Sugar from Cyclamen europæum*.—Dr. Michaud has separated from the tubercles of *Cyclamen europæum* a new sugar belonging to the group represented by the formula $C_{12}H_{22}O_{11}$. Contrary to the rotatory properties of the other sugars of this group, cyclamose was found to be laevo-rotatory. It reduces Fehling's solution.—Chem. News, May 14, 1886, 232.

Arabinose—*Identity with Galactose*.—Several years ago (see Proc. 1881, 311) Mr. Kiliani expressed the opinion that arabinose, the sugar obtained by treatment of gum arabic with dilute acid, was identical with galactose, a decomposition production of milk sugar similarly treated. This opinion was, however, controverted on chemical grounds, and that

* H. Ritthausen and F. Weger speak of *melitose* as occurring in cotton seed along with *betaine*. See Proceedings, 1885, 333.—Rep.

of an alleged difference in the behavior of the two bodies towards yeast. Mr. Muntz has now made experiments which clearly indicate the identity of the two bodies, and he therefore suggests that the name "arabinose" be abandoned.—Pharm. Jour. and Trans., April 3, 1886, 842; Compt. Rend., cii. 624.

Sennit (*Sugar of Senna, Cathartomannit*).—The sugar of senna leaves was isolated by Kulby in 1865, and named cathartomannit. Mr. Alfred Seidel has now further examined this substance, for which he proposes the name of *sennit*. The most satisfactory process for preparing this sugar was by concentrating in vacuo the aqueous infusion of the leaves, precipitating mucilage and salts from the syrupy liquid by two volumes of strong alcohol, filtering, distilling off the alcohol, diluting the residue with water, digesting for 24 hours with oxide of lead, again evaporating in vacuo to a syrupy consistence, crystallizing upon flat plates over burned lime, which requires 4 or 5 weeks, and purifying by recrystallization from methyl alcohol, and washing with absolute alcohol. Thus prepared sennit has the composition $C_6H_{12}O_6$, and forms colorless microscopic hemidric crystals of the rhombic system, mostly sphenoids with curved sides. It has a very sweet taste, melts at $183^\circ C.$ (corrected 185.6°), and is soluble at ordinary temperature (about $20^\circ C.$) in $1\frac{3}{4}$ parts water, 450 absolute alcohol, 48 alcohol of 90 per cent., 82 methyl alcohol, and about 10,500 parts of absolute ether. It is dextrogyrate, unfermentable, prevents the precipitation of copper and iron salts by alkalies, and does not reduce Fehling's solution (also not after boiling with acid), silver nitrate, or solutions of gold or platinum. By treatment with diluted nitric acid, it yields oxalic acid, but no mucic acid. On evaporating sennit with an excess of diluted nitric acid, a snow-white mass is left which dissolves with an intense yellow or yellow-red color in ammonia, and with a yellow color in sodium acetate; on the addition to the ammoniacal solution of a drop of barium chloride solution, a reddish-brown precipitate is produced, the liquid gradually becomes rose-colored, and on spontaneous evaporation leaves a raspberry-red residue. Similar colorations are produced by strontium chloride, but the residue is in transmitted light rose-colored, while in reflected light it is green and has a metallic lustre. These characteristic color reactions are at once produced in the solution in sodium acetate mentioned above. Inosit, quercit and probably pinit, give a similar reaction, but not mannit, dulcit, glucose or saccharose. Compounds with calcium, barium and lead were prepared, also an acetyl compound, showing sennit to be a pentatomic alcohol.—Amer. Jour. Pharm., Nov. 1885, 557; from the Author's Inaugural Essay, Dorpat.

ORGANIC ACIDS.

Oxalic Acid—Purification by Sublimation.—The method usually adopted for preparing chemically pure oxalic acid (crystallization from hot

solution of oxalic acid in dilute muriatic acid) is tedious and entails considerable loss. Soltsien obtains pure oxalic acid by sublimation. Care must be taken to deprive the acid of its water of crystallization at a temperature not exceeding 85°C .; while still warm it is placed in a porcelain evaporating dish and covered with filtering paper, over the paper is placed a cone of filtering paper and a glass funnel. It is then heated on a sand-bath at a temperature below 150°C . Sublimated oxalic acid is hygroscopic. To prepare a normal solution it is of course advisable to keep in a desiccator with sulphuric acid or to recrystallize.—*Amer. Jour. Phar.*, Feb. 1886, 103; from *Chemisch-technischer Central Anzeiger*, iv. p. 139.

Oxalic Acid—Non-Poisonous Substitute.—Dr. H. Hager recommends a mixture of equal parts of partly desiccated alum and citric acid as a substitute for oxalic acid. The mixture must be reduced to a fine powder, and might be dispensed where oxalic acid is asked for and the dispenser has his doubts regarding the intention of the purchaser—*Phar. Rundschau*, xii. 167.

Oxalate of Calcium—Distribution in the Leaves of Various Species of the Leguminosæ, which see under “*Materia Medica*.”

Glyoxalic Acid—Occurrence in the Juices of Unripe Grapes, Apples, Plums, Gooseberries, and Rhubarb Stalks.—The unsuccessful search for this acid in the juice of unripe grapes by Messrs. Brunner and Brandenburg ten years ago (*Ber. d. D. Chem. Ges.*, ix., 982) has induced Messrs. Brunner and Chuard to continue experiments in this direction. They employed in their present experiment a more immature fruit than had been employed in the former, believing that the succinic acid then found was formed during the maturing of the fruit from previously existing glyoxalic acid. Using, therefore, the juice of grapes in the most immature stage, gathered immediately after the setting of the berries, the expected acid was readily recognized. It was afterwards obtained more economically from unripe apples, plums, currants, gooseberries, and rhubarb petioles. Indications of its presence also in the leaves of these plants were observed, and it was conjectured that the acid might be formed in the leaves and pass from them to the fruit, a theory that finds support in the fact that whilst glyoxalic acid gradually diminishes in the ripening fruit and at last disappears, it can even then be detected in the leaves. Another observation made by the authors led to the discovery of a new glucosidal acid, which they have provisionally named

Glycosuccinic Acid.—They found that on adding solution of iodine to the juice of an unripe fruit it combined to form a colorless liquid, the quantity so taken up being less in proportion as the fruit yielding the juice had been ripe. The reaction was traced to the new acid, which is capable of splitting up into a sugar and succinic acid, whence its provisional name. This acid appears to be widely distributed, it having been

detected in acotyledons, monocotyledons and dicotyledons, and the authors discuss the probable origin and relation of the assimilation products of plants at great length.—Pharm. Jour. and Trans., May 1, 1886, 917; Ber d. D. Chem. Ges., xix. 595.

Vinegar—Estimation of Free Sulphuric Acid.—Mr. B. Kohnstein has devised the following expeditious method:

Shake 100 cc. of the vinegar with freshly ignited magnesia until the liquid ceases to have an acid reaction, then filter. Evaporate 25 or 30 cc. of the filtrate to dryness in a platinum capsule, then ignite the residue at a low red heat. This causes the conversion of the acetate into carbonate of magnesium, while the sulphate of magnesium remains unaltered. In order to render the residue more friable, it is moistened with carbonic acid water, and again evaporated; then digested with hot water and filtered. When the washings cease to give a reaction of sulphuric acid, and any lime that might be present in the filtrate has been precipitated, the magnesia now remaining in the filtrate (and washings) is precipitated as pyrophosphate, and from this the quantity of sulphuric acid is calculated.

Should magnesium salts occur in the original vinegar, these may be determined separately by evaporating a portion of the vinegar to dryness, igniting, redissolving the residue with a little hydrochloric acid, separating any lime, and determining the magnesia as pyrophosphate, which is then deducted from the quantity subsequently found.—Amer. Drugg., Aug. 1885, 147; from Dingl. Pol. J. and Chem. Zeit.

Acetate of Magnesium—Preparation and Character.—Dr. Kuhl prepares acetate of magnesium by treating acetic acid, containing 15% monohydrate, with carbonate of magnesium in slight excess, heating to drive off carbonic acid, filtering the faintly alkaline liquid, neutralizing with dilute acetic acid, and evaporating on a water bath until a gum-like pellicle begins to form, in which condition the solution has a sp. gr. of 1.3. If now a few crystals from a previous operation are strewn upon the surface, or a little dry salt specially prepared, the acetate will crystallize slowly, frequently forming handsome crystals several centimeters in length. The crystals are truncated columns, belonging to the monoclinic system, melt at 80° C., and are decomposed at a higher temperature. The salt is permanent in ordinary air, loses water in dry air, and is hygroscopic in moist air. It appears to contain 4 mol. of water of crystallization, is soluble in less than its weight of water, and readily soluble also in alcohol. Its sp. gr. is 1.4487. The author appends a table showing the sp. gr. of solutions of the salt of different strengths; that of a 50% solution being 1.2015.—Arch. d. Pharm., Feb. (2) 1885, 158-161.

Crystallized Subacetate of Lead—Preparation.—Mr. James Kennedy recommends the preparation of crystallized subacetate of lead, for the

purpose of preparing the cerate (which see under "Pharmacy"), as follows: Dissolve 4 parts of acetate of lead in 4 parts of boiling distilled water, add 3 parts of calcined litharge, boil for fifteen or twenty minutes, stirring, and occasionally adding water to replace that evaporated, allow to stand a few minutes, decant and filter the solution; concentrate by evaporation and allow to crystallize. By dissolving 25 parts of this salt in 75 parts of previously boiled water, a

Liquor Plumbi Subacetatis, corresponding to the officinal requirements, is obtained.—Pharm. Rec., Febr. 15, 1886, 50.

Formic Acid—Value as an Antiseptic.—Dr. Schulz also recommends formic acid (see Proceedings 1885, 288), as a valuable antiseptic, which in very weak solutions effectually prevents the decomposition of organic substances.—Amer. Jour. Pharm., Feb. 1886, 92; from D. Med. Wochenschr.

Lactate of Quinine—Value for Hypodermic Use, etc.—Mr. Vigier draws attention to lactate of quinine as being a salt relatively rich in alkaloid, and at the same time one of the most soluble in water. He considers the lactate to be better suited than any other salt of quinine for hypodermic injection, and recommends the use of a solution made by dissolving 1 part in 4 parts of warm water and filtering. The solution should be neutral. An ointment may be made consisting of 1 part of lactate of quinine and 9 parts of lard.—Lancet, Aug. 15, 310; Pharm. Jour. and Trans., Aug. 29, 1885, 187.

Benzoic Acid—Determination.—In his paper on syrup of tolu (see Proceedings 1885, 89), Mr. Edo Claassen had expressed the supposition that the quantity of benzoic and cinnamic acids present could be determined by treatment with carbonate of magnesium, precipitation of the magnesium dissolved by these acids with ammonio-phosphate of sodium, and heating of the washed precipitate to redness; the amount of the acids being calculated from the quantity of phosphate of magnesium obtained. He has since made a series of experiments which convinces him that the process is impracticable, since the benzoate of magnesium has the property of dissolving a variable excess of magnesia.—Pharm. Rundschau, Aug. 1885, 172-173.

Benzoate of Sodium—Antiseptic Value for Food. See *Antiseptics*, under "Pharmacy."

Cinnamic Acid—Use as a Deodorizer for Iodoform, which see under "Alcohols."

Salicylic Acid—Determination by the Synthetical Formation of Gaultheria Oil.—Prof. Chas. O. Curtman finds the following method for the detection of salicylic acid to be applicable to the detection of very small quantities. The substance to be tested is mixed with 1 cc. of methyl alcohol, $\frac{1}{2}$ cc. of conc. sulphuric acid is then carefully added, the mixture heated

to boiling for a short time, and then set aside a few minutes. Upon again heating, the odor of methyl-salicylic ether becomes quite plain in the presence of 1 milligram of salicylate of sodium.—Pharm. Rundschau, July 1885, 153.

Salicylic Acid—Action on Ferments.—Dr. A. B. Griffiths has made comprehensive chemical and microscopical studies of the action of salicylic acid on ferments, from which he draws the following conclusions:

1. That a certain solution of salicylic acid has no action on the living torula, but dissolves it when dead, showing that some chemical change (post-mortem) has taken place in the cellulose of the cell-wall.
2. That the solution of salicylic acid destroys "disease ferments" by acting upon the cell-wall, showing that their cellulose most probably differs from the cellulose of the torula cerevisiæ.
3. That the solution of salicylic acid prevents the hydrating action of the various soluble zymases.
4. A solution of sodium phosphate and potassium nitrate revivifies exhausted yeast, and even increases the yield of alcohol in saccharine solutions.
5. Salicylic acid acts as an antiseptic agent of great value, because it acts directly on the disease ferments in beers, and not upon the true alcoholic ferment.
6. Salicylic acid is not a poison in quantities far exceeding the amount in the solution given in this paper. The acid is largely used in medicine in both France and Germany.—Amer. Jour. Phar., April 1886, 178-180; from Chem. News, Jan. 15, 1886, 29.

Salicylic Acid—Use as a Preservative.—Dr. R. G. Eccles, in reply to a query respecting the applicability of salicylic acid as a preservative for alkaloid solutions, gives the result of his experiments which are in the main unfavorable to its employment for such purposes. His choice for this purpose would be benzoic acid, which recommends itself because of its non-irritant character, and because it is less frequently contra-indicated than either salicylic or boric acids.—Proc. N. Y. State Pharm. Assoc., 1886, 156-160.

Salicylates—Feeble Stability.—Dr. Vulpius directs attention to the fact, already brought forward previously by others, that the peculiar antizymotic or antiseptic property of free salicylic acid is obliterated when the latter is neutralized by bases. He made a series of parallel experiments with 1 per cent. solutions of the salicylates and the sulphates of ammonium, magnesium, copper, zinc, atropine, morphine, physostigmine, and pilocarpine. In the case of the sulphates, two sets of experiments were made, one in which the sulphates alone were used, and the other in which they were treated with 0.1 per cent. of free salicylic acid. All of the latter (sulphates containing free salicylic acid), remained abso-

lutely unaltered after 100 days; the solutions of the pure sulphates, with the exception of one scarcely turbid sample, were likewise unchanged. But nearly all the solutions of the pure salicylates were spoiled already after a few weeks. The author furthermore remarks that the choice of a salicylate is not always occasioned by the desire to select a salt which could not spoil. In the case of the salicylate of physostigmine, for instance, the reason why this salt is preferred is that it is in distinct, dry, and non-deliquescent crystals, and does not cake. So far as the keeping qualities of solutions are concerned, however, the sulphates are greatly preferable to the salicylates.—Arch. der Pharm., 1885, 794.

Salicylates—Preparation.—Mr. Milone gives methods for preparing different salicylates, as follows:

Salicylate of Barium, $\text{Ba}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot \text{H}_2\text{O}$, is prepared by treating a hot aqueous solution of salicylic acid with barium carbonate, and filtering while hot.

Salicylate of Calcium, $\text{Ca}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot 2\text{H}_2\text{O}$, is prepared in like manner from calcium carbonate.

Salicylate of Strontium, $\text{Sr}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot 2\text{H}_2\text{O}$, in the same way from strontium carbonate.

Salicylate of Magnesium, $\text{Mg}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot 4\text{H}_2\text{O}$, is prepared by treating a hot solution of barium salicylate with magnesium sulphate, and quickly filtering the hot solution while evaporating.

Salicylate of Zinc, $(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot 2\text{H}_2\text{O}$, is prepared like the magnesium salicylate from zinc sulphate.

Salicylate of Cadmium, $\text{Cd}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot \text{H}_2\text{O}$, in the same way as magnesium salicylate from cadmium sulphate.

Salicylate of Manganese, $\text{Mn}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot 2\text{H}_2\text{O}$, is prepared like barium salicylate, from manganese carbonate.—Phar. Rundschau, xii. 213.

Salicylate of Sodium—Preservation.—It has been pointed out by a correspondent of "Pharm. Centralh.," that if salicylate of sodium is exposed for some time to the light in a white glass, the exposed portion will acquire a darker color in four to six weeks. At the same time it will have lost its faintly acid reaction, and will yield a colored solution. On the other hand, the portion which had not been exposed will have remained unaltered, produce a colorless solution, and have a slight acid reaction. It appears, therefore, that salicylate of sodium should be protected from light, and as it is hygroscopic, it should also be protected against dampness.—Amer. Drugg., June, 1886, 112.

Salicylate of Sodium—Administration.—Mr. F. Hellwig, who is himself a victim of rheumatism, and compelled to take salicylate of sodium, had occasion to dispense to a lady, the salt both in form of wafers and capsules, and as mixture with orange-flower syrup and water. The wafers, as

well as the capsules, were not tolerated by the patient's stomach, but the mixture answered fairly well. He has since dispensed the salt in admixture with syrup of orange-peel and water, and finds this to be by far the most pleasant composition. The mawkish after-taste of the remedy is best obliterated by a small dose of brandy containing some common salt.—Arch. d. Pharm., vol. 234, 80.

Salicylate of Lithium—Value in Rheumatism.—Dr. Vulpian has used salicylate of lithium with advantage in certain forms of rheumatism that do not yield to salicylate of sodium. The lithium salt is prescribed in the same doses as the sodium salt, though it contains a larger percentage of salicylic acid: but it is stated that the difference in physiological action is not referable to this fact.—Pharm. Jour. and Trans., Dec. 26, 1885, 543; Lancel, Dec. 19, 1885, 1161.

Salicylate of Iron—Preparation—Mr. H. T. Eberle has devised the following process for preparing salicylate of iron, which he finds to give a satisfactory product:

Take of sulphate of iron	100 parts.
carbonate of sodium	110 parts.

Dissolve the sulphate of iron and carbonate of sodium separately, each in two hundred parts of boiling water, and filter both solutions. Mix them when cold, and allow the precipitate of carbonate of iron to subside. Pour off the supernatant liquid, and wash the precipitate with water until the washings are no longer rendered turbid with solution of chloride of barium. Then pour the precipitate into an evaporating dish, and gently warm over a water-bath, adding salicylic acid until effervescence ceases and the precipitate is entirely dissolved. Lastly, evaporate the solution on the water-bath to dryness, and powder the residue.—Amer. Drugg., Nov. 1885, 221.

Salicylate of Bismuth—Use in Cases of Diarrhœa.—Dr. Solger recommends basic salicylate in cases of diarrhœa and chronic intestinal catarrh. He has prescribed it with good results with an equal quantity of sugar of milk in 1.25 gram doses.—Jour. Soc. Scient., May 19, 1886, 195.

Salol—A New Antipyretic and Antiseptic.—This compound has been prepared by Professor Neucky, and is said to possess powerful antipyretic and antiseptic properties, capable of replacing salicylate of sodium in cases where that salt is badly tolerated. Salol is a derivative of salicylic acid in which one atom of hydrogen is replaced by the phenol group. It is a white powder, having a faint aromatic odor, and, being almost insoluble in water, is perfectly tasteless. The dose is about the same as that of salicylate of sodium.—Pharm. Jour. and Trans., May 29, 1886, 1005; Pharm. Centralh., May 6, 1886, 219.

Citric and Tartaric Acids.—Occurrence in the leaves of *Ampelopsis hederacea*, which see under "Materia Medica."

Citrate of Bismuth—Turbidity of its Solution due to the Presence of Bismuth Chloride.—Mr. Rother's method for the preparation of solution of bismuth citrate (see Proceedings 1876, 332), having been criticized unfavorably in some of the British journals, on account of a slight turbidity observed, he has made some further experiments, and finds that when this turbidity occurs it is due to a contamination of the subnitrate used with more or less chloride. In the experiments made by the author he found this contamination of commercial subnitrate to be very trifling, amounting to not more than one and one-fourth per cent. of the subnitrate; sufficient, however, to give rise to the turbidity objected to. He considers that, inasmuch as the turbidity is easily overcome by filtration, the consequent loss is too trifling to need consideration in practice.—*Amer. Jour. Pharm.*, May 1886, 237-238.

Tartaric Acid—Commercial Quality.—Mr. James O. Howells has subjected five commercial samples of tartaric acid, four of them being the product of leading American manufacturing chemists, to examination. He found them to contain respectively 99.43, 99.42, 99.75, 99.50, and 99.49 per cent. absolute tartaric acid, and to leave on incineration .08, .06, .07, .06 and .06 per cent. of ash respectively. Only a trace of it was found in three of the samples when heated at 100° C. to constant weight. They were free from impurities, and filled the requirements of the Pharmacopœia with the exception of yielding a little more ash and falling a little below in percentage of absolute acid.—*Amer. Jour. Pharm.*, July 1885, 327.

Argols.—Assay of native samples. See *Grapes and Wine*, under "Materia Medica."

Cream of Tartar—Commercial Quality.—Mr. E. H. W. Stahlhuth has examined a number of commercial specimens of cream of tartar, and obtained remarkably favorable results in the case of drug-stores, and the opposite in the case of groceries. The method of examination being given, the author observes that the samples from manufacturers were all as represented. They contained from 99.9 to 99.75 per cent. of pure cream of tartar. Those from drug stores were all nearly pure, containing but little tartrate of calcium, while not one was adulterated. Of the samples obtained from grocery stores, but one was pure; that was in a one-quarter-pound package, and was sold at fifteen cents per package. Two samples were substitutes, and consisted of bicarbonate of sodium. It would appear that the dealer made a mistake, but both claimed that it was cream tartar, and not baking soda. One of these was sold at ten cents per pound, while the other was sold at cream tartar prices. The other seven samples were grossly adulterated; the adulterants were: alum, starch, plaster of Paris, acid phosphate of calcium, and chalk.

Cream of Tartar—Commercial Quality.—Twelve specimens of cream

of tartar from different druggists were examined in the laboratory of Purdue University under the careful supervision of Prof. Robt. B. Warden. While the limits of impurity are fixed at a "turbidity" caused by barium and silver salts, few specimens will meet a rigid interpretation of the requirements. Not more than one or two of the twelve samples, however, seemed to have enough sulphate to be called an actual impurity, while only one contained a questionable amount of chloride. The tests for calcium were made in Nessler tubes, resting upon a fine dotted line on white paper; the fluid was considered "cloudy" when the dots were obscured, and "turbid" when printed letters were indistinguishable. With this interpretation of the pharmacopœial test, seven samples were pronounced good, one was fair, and four were questionable. Two samples gave unmistakable reactions for starch. A thirteenth sample (expressly sold as a cheaper grade) had a decided excess of sulphate and a questionable amount of calcium.—*Amer. Jour. Pharm.*, June 1886, 286.

Cream of Tartar—Commercial Purity.—Prof. P. W. Bedford has examined a number of samples of cream of tartar with a view to determining whether an article, containing 99 % of absolute cream of tartar, was readily obtained in the market. He finds that several manufacturers produce cream of tartar of much purity, and that he had no difficulty to find such in the open market.—*Proc. N. Y. State Pharm. Assoc.*, 1886, 202–203.

Antimonii et Potassii Tartras—Examination of Commercial Samples.—Mr. E. G. Eberhardt examined five commercial samples of tartar emetic, and one sample (No. 6) of his own make. All of them contained arsenic, but, with the exception of No. 5, none in objectionable quantity. With the exception of No. 2, which was dirty, all were soluble in the prescribed quantity of water, showing the absence of cream of tartar or oxide of antimony. Nitrate of silver gave no reaction for chlorides, and ferrocyanide of potassium showed the absence of iron, etc. Special care was taken in the application of Fleitmann's test for arsenic:

	BaCl ₂ .	Am ₂ Ox.	Fleitmann's Test.
No. 1	Slight opalescence.	None.	Trace.
No. 2	None.	Trace.	"
No. 3	"	"	"
No. 4	"	"	"
No. 5	Slight turbidity.	"	Considerable.
No. 6	None.	None.	Slight trace.

Attempts were made to titrate tartar emetic with caustic soda, the oxide of antimony being precipitated; but the method is applicable only in case of gross adulteration.—*Amer. Jour. Pharm.*, March 1886, 228–229.

Tartar Emetic—Commercial Quality.—Mr. Alfred H. Jackson has

examined a number of commercial samples of tartar emetic, and gives the results, together with the method of analysis. Two samples, supplied by pharmacists, were not adulterated, while five samples obtained from chemical merchants, etc., were adulterated with sulphate of potassium to the extent of 40 to 70 per cent.—Yearbook of Pharm., 1885, 459-462.

Pipitzahoic Acid—Chemical Relations.—According to Mr. F. Mylius, pipitzahoic acid (see Proceedings 1884, 149-150) is not a true acid, but a hydroquinone containing the group C_6H_5 , and should be called *perzone*. Its compound with aniline, *anilidoperezone*, crystallizes from hot alcohol in blue needles, melts at $138^\circ C.$, is insoluble in water, sparingly soluble in alcohol and in alkalis, but freely soluble in carbon disulphide, petroleum, benzin, benzol, ether, chloroform, and glacial acetic acid; the solution in strong sulphuric acid is dark blue, and on heating becomes cherry-red and yellow. By heating this compound with dilute sulphuric acid, *hydroxyperezone*, $C_{15}H_{20}O_4$, is obtained, which crystallizes in glossy reddish-yellow scales, is freely soluble in alcohol, chloroform, benzol, and glacial acetic acid, is a feeble acid, and dissolves in strong sulphuric acid with a cherry-red color, changing to yellow on heating, with the formation of *percinone*, $C_{15}H_{14}O_3$. A number of other derivatives were prepared by the author.—Amer. Jour. Phar., Feb. 1886, 90; from Ber. D. Ch. Ges., 1885, 936.

Messrs. R. Anschütz and W. Leather also prepared other derivatives of pipitzahoic acid. Mr. Anschütz agrees with Mylius in regarding the natural product as a hydroquinone. The melting points of the acid and derivatives were lower than those ascertained by Mylius. The aniline-derivative is sublimable in steel blue needles.—Ibid; from Ibid, 709-715.

Anisic Acid—Uses as an Antiseptic.—Anisic acid has been recommended as an antiseptic application for sores, and as an antipyretic remedy which resembles salicylic acid in its action and has slightly toxic effects. The acid is an oxidation product of anethol, and may be prepared from oil of anise and other volatile oils containing anethol by oxidation with nitric acid, or with potassium bichromate. Zervas recommended its preparation from 6 parts of the bichromate, 9 of water, and 7 of sulphuric acid, to which mixture 1 part of anise oil is added; after the reaction has subsided cold water is added, and the acid is purified by recrystallization.

Anisic acid has the formula $C_8H_8O_3$, crystallizes in colorless, glossy needles or rhombic prisms, is inodorous, has a slight taste and an acid reaction, and dissolves in alcohol, ether and hot water, crystallizing from the latter solution on cooling. It melts at $175^\circ C.$, and volatilizes at a higher temperature. Its alkali and ferrous salts are insoluble in water; most of the other salts are sparingly soluble, and may be obtained in crystals by double decomposition in sufficiently diluted solutions. Schultzen and Graebe ascertained, in 1867, that in the animal economy,

anistic acid forms *anisuric acid*, $C_{10}H_{11}NO_3$, which is a substitution product of glycocoll—*Amer. Jour. Pharm.*, June 1886, 299.

Chrysophanic Acid—Formation by the splitting up of chrysophan in the presence of water and a ferment-like body existing in *Rhubarb root*, which see under “*Materia Medica*.”

Chrysarobin—*Application in Liquor Gutta-Percha*.—In a note upon the treatment of ringworm of the scalp, Dr. W. T. Alexander recommends epilation and the use of a ten per cent. solution of chrysarobin in liquor gutta-perchæ, which forms a pellicle upon the surface, preventing the further extension of the disease. This treatment was very successful.—*Journal of Cutaneous and Venereal Diseases, Med. Times. Am. Jour. Pharm.*, Sept. 1885, 437.

Chrysarobin—*Application to Prevent Staining*.—A writer in “*Birmingham Med. Review*” observes that the staining of the clothes caused by chrysarobin may be prevented by making the latter into a dough with water, and after applying to the diseased spot, covering it with a layer of collodion.—*Amer. Jour. Phar.*, Aug. 1885, 381; from *Cinc. Lancet*.

Anemonic and Anemoninic Acid.—Cause of formation, etc., in *Ranunculaceous Plants*, which see under “*Materia Medica*.”

Polygonic Acid.—Existence as a distinct principle in *Polygonum Hydro-piper*, which see under “*Materia Medica*.”

Chrysatropic Acid.—A fluorescent body from *Atropa Belladonna*, which see under “*Materia Medica*.”

A New Vegetable Acid has been isolated by Dr. Popoff from the berries of *Rubus Chamamorus*, which see under “*Materia Medica*.”

Tannin—*Volumetric Estimation*.—Mr. E. Durien has communicated a process for the volumetric estimation of tannin, which is based upon the following reactions:

1. That the addition of chloride of iron solution to one of tannin forms a black or green coloration; and
2. That its coloration is destroyed, little by little, and then completely, on the addition of a solution of chlorinated lime.

The mode of operation, with the results obtained, is as follows:

1. Prepare a solution of calcium hypochlorite (10. gm.) in distilled water (200 gm.) and filter.
2. Make a second solution of pure tannin by this formula:

Tannin, pure	0.10 gm.
Official solution of ferric chloride	15 drops.
Acid acetic, concentrated (glacial)	20 drops.
Distilled water	20 cc.

This solution is made in a 100 cc. glass flask and serves as a titrate to the first solution. With a Gay-Lussac burette, graduated to the one-tenth

of a cc., rapidly add, drop by drop, the hypochlorite, agitating after each addition, when the green or black color of the liquid will gradually grow lighter and pass, suddenly, to a rose-brown, at which point the operation must be arrested. This rose-brown color, by the action of the air, passes to a green, but there is no need of taking into calculation this secondary reaction. Working in this manner it will be found that 14 cc. of solution of hypochlorite will be required to destroy the inky color formed from 0.10 gm. of pure tannin.

To fully establish the accuracy of his method, Mr. Durien made various mixtures of sugar and pure tannin, in order to ascertain what influence, if any, organic substances might have upon the results.

The following table gives the figures obtained :

Substance.	Amount.	Sol. of hypochlorite used.	Tannin found.	Tannin calculated.	Difference.
Tannin, pure. . .	0.10 gm.	14 cc.			
Mixture A. . .	0.15 gm.	10.5 cc.	0.075 gm.	0.075 gm.	0.000 gm.
Mixture B. . .	0.20 gm.	13.9 cc.	0.099 gm.	0.100 gm.	0.001 gm.
Mixture C. . .	0.30 gm.	20.8 cc.	0.148 gm.	0.150 gm.	0.002 gm.

This series of analyses demonstrates that with this test a most excellent approximation may be made to the quantity of tannin present, and that sugar has no influence on the results. With this process, an assay of commercial tannin can be made in less than ten minutes.—*Annali di Chim. Med. Farm.*, Dec. 1885, 350; *Jour. Pharm. Chim.*, 1885, xii. 374.

Mr. Joseph W. England, who draws attention to the above process as being easy of execution and yielding excellent results, some time ago, without any knowledge of Mr. Durien's method, employed a similar method, using the tannin, however, in neutral solution with ammonia. He suggests that solutions of hypochlorite of sodium, in the form of "Labarraque's Solution," may be employed instead of the calcium compound.

Since gallic acid, as well as tannin, rendered inky by the addition of ferric salts, is changed in color by hypochlorites, the absence of that body in the tannin solutions must be previously determined in the application of Mr. Durien's method.—*Amer. Jour. Pharm.*, March 1886, 120-122.

Tannins—Estimation.—Mr. H. R. Proctor revises and criticizes the recent contributions to the estimation of tannins in a paper read before the New Castle Section of the Society of Chemical Industry (*Journal*, Feb. 1886, 27), which see in *Pharm. Jour. and Trans.*, April 3, 1886, 843-845.

Tannates of Mercury—Methods of Preparation.—Mr. C. Casthelaz discusses various methods for the preparation of the tannates of mercury. The methods recommended for the preparation of

Mercurous Tannate have been the precipitation of a solution of mercurous nitrate with tannin or tannate of soda; but these are objected to because of the difficulty in keeping free from mercuric salt and for other reasons. The author prefers to utilize the difference in solubility of the two acetates of mercury for the purpose. He dissolves mercurous acetate in hot water either with or without the addition of glucose to reduce any contamination of mercuric salt, filters the solution, and after it has been cooled to 50° C. pours it into a cold filtered solution of tannic acid in excess. The mercurous tannate separates as a greyish gelatinous precipitate, which only requires to be washed, drained, pressed and dried at a low temperature. The mercurous tannate may vary in appearance, through coloring matter of the tannin, and the color may also be darker or lighter according to the temperature at which it is dried; but usually it forms blackish-gray, resinous looking plates, difficult to powder. It gives up a portion of its tannin when treated with water.

Mercuric Tannate may be prepared by boiling acid solution of nitrate of mercury with solution of acetate of sodium in excess until conversion into mercuric acetate and nitrate of sodium has taken place, and then precipitating with solution of tannic acid. The author, however, recommends that it be prepared by precipitating an alcoholic solution of mercuric acetate with an alcoholic solution of tannic acid. The brick-red precipitate of mercuric tannate thus obtained is said to be more stable, more readily dried, and to yield a darker reddish powder than that prepared in the other ways.—Pharm. Jour. and Trans., Oct. 3, 1885, 367; Jour. de Pharm., October 15, 1885, 352.

Hydrargyrum Tannicum—Characters.—The Pharmacopœia Commission of the German Apothecaries' Association gives a definition of the characters of this compound. It occurs in faint glistening, brown-green scales, yielding by trituration a greenish-gray, odorless and tasteless powder, which is insoluble in the ordinary solvents, but gives up tannin to both water and alcohol. It is decomposed by acids and alkalies, and when treated with hydrochloric acid furnishes an amount of mercurous chloride equal to at least 40 per cent. of mercury. The maximum single dose is 0.1 gram, daily 0.3 gram.—Arch. d. Pharm. July 2, 1885, 545.

Pyrogallic Acid.—Use as a reagent for Nitric Acid, which see under "Inorganic Chemistry."

Biliary Acids—Behavior to Gelatin and Gelatin Peptone.—According to Mr. F. Emich, glycocholic acid does not precipitate gelatin solutions, but taurocholic acid does, even from very dilute solutions, and in a very complete manner; the taurocholic acid cannot be removed from the precipitate by boiling alcohol. 1 part of gelatin combines with from 0.68 to 1.49 parts of taurocholic acid.

Taurocholic acid precipitates gelatin peptone, but only incompletely.

These reactions are of physiological importance.—*Jour. Chem. Soc.*, 1885, p. 822; from *Monatsh. Chem.*, vi. 95–103.

ORGANIC BASES.

Alkaloids—Production by the Action of Ammonia upon Glucose.—The observation that the prolonged contact of essential oil with ammonia gave rise to a distinct formation of alkaloid has enabled Mr. Tanret to make an interesting contribution to the history of organic bases, since it led him to experiment whether other bodies possessing, like some of these, alcoholic functions, might not produce the same reaction. With glucose he obtained somewhat remarkable results, a mixture of 60 parts of glucose and 100 parts of pure ammonia (sp. gr. .907), after being heated 30 or 40 hours in a sealed tube to 100° C., yielding, besides carbonate of ammonium, free ammonia and formic acid, about 1.5% of a mixture of alkaloids. The basic constituents were removed from the syrup, after acidulating it with dilute sulphuric acid, by means of chloroform, and, after purification, proved to consist of about one-third solid alkaloids and two-thirds liquid alkaloids. The latter was resolved by fractional distillation into two distinct alkaloids, named

1. *Glucosine*, boiling at 136° C., and represented by the formula $C_6H_8N_2$, and

2. *Glucosine*, boiling at 160° C., and represented by the formula $C_7H_{10}N_2$.

These glucosines are described as very volatile, colorless, strongly refracting liquids, having a sharp peculiar odor, and without action on polarized light. They are precipitated from acid solution by the ordinary alkaloidal reagents. Their reaction is only slightly alkaline, and like other feeble bases, as caffeine, narcotine, etc., they are removed by chloroform from their acid solutions. They form crystalline hydrochlorates which are very deliquescent.—*Compt. Rend.*, c. 1540; *Phar. Jour. and Trans.*, Aug. 1, 1885, 107.

Alkaloids—Formation in the Human Organism.—The formation of alkaloids in the human organism under certain conditions is now fully recognized, and their presence in the urine has been demonstrated, but different opinions have been expressed as to whether they are found in other than pathological urines. This question has now been investigated by Mr. A. Villiers, who has arrived at the conclusion that normal urine contains no alkaloidal matter, but that in the course of a great number of diseases, even when the attacks are very slight, alkaloids—probably varying much in proportion and in toxic properties—are formed in certain organs, pass into the circulation, and are eliminated by the kidneys. Mr. Villiers speculates as to whether in certain cases the treatment of disease may not resolve itself into a struggle to prevent the accumulation of these substances in the system, and seems inclined to attribute the virtue

of *tisans* and similar preparations to the eliminative action of large quantities of water.—Rep. de. Phar., July 1885, 298; Phar. Jour. and Trans., Aug. 1, 1885, 108.

Alkaloids—Limit of Reaction of some Reagents.—Mr. Frank A. Rhyme has made a series of investigations to determine on the one hand to what extent a solution of the more important alkaloids may be diluted and still afford a perceptible reaction with the commonly employed alkaloidal reagents, and on the other hand to determine to what extent these reactions are modified by the presence of various foreign organic bodies. The reagents employed were solutions of potassio-mercuric iodide, iodine in iodide of potassium, picric acid, and phosphomolybdic acid; the preparation of the solution being given. The results obtained with a large number of alkaloids are given in form of a table.—Contrib. Dept. Pharm. Univ. Wisc., No. 2 (1886), 45-48.

Opium Alkaloids—Character of the Compounds with Nitroprussic Acid.—In a former paper Dr. Edmund W. Davy described compounds formed by nitroprussic acid with the alkaloids of cinchona, nux vomica, etc. (see Proceedings 1881, 325-326). Dr. Davy now contributes a further paper on the nitro-prussides of the more important opium bases: morphine, narcotine, codeine, narceine, thebaine and papaverine. He finds that all these bases form with nitroprussic acid, salts that are sparingly soluble in cold water, but much more soluble in hot water, the solubility of the morphine salt increasing from 1 in 173 at the ordinary temperature to 1 in 8 at 100°C.

Nitroprusside of Morphine is the only salt obtainable in really crystalline form, the other salts being either amorphous or showing a slight tendency to crystallize. Some of the nitroprussides, when heated gently under water, melt, without dissolving, at a temperature much under that of boiling water, and on cooling assume a resinous condition.

Nitroprusside of Narcotine and

Nitroprusside of Thebaine readily dissolve in chloroform.

Nitroprusside of Narceine and

Nitroprusside of Papaverine are sparingly soluble in chloroform, while

Nitroprusside of Codeine and the morphine salt appear to be completely insoluble in that liquid. The author thinks that nitroprussic acid might be used as a means of separating these alkaloids, and in the estimation of morphine from opium.—Pharm. Jour. and Trans., Jan. 30, 1886, 642; from Trans. of the Roy. Irish Academy, 1885.

Morphine—Borax a Precipitant.—According to Dr. Hoffmann, borax precipitates morphine in long acicular crystals. The borax solution is added until the morphine solution contains from 3 to 4 per cent. of borax—after 20-25 minutes the crystals of morphine can be separated, washed and weighed.—Phar. Rundschau, xii. p. 69.

Sulphate of Morphine—Examination of Commercial Samples.—Mr. Albert E. Brown, Ph.G., has analyzed five commercial samples of this salt, two coming from American manufacturers, one each from England and Germany, and the fifth was made by the author. The water was determined by exsiccating the salts at a temperature of 130° C. (266° F.); the sulphuric acid by precipitation with barium chloride, and the solubility by macerating an excess of the salts in distilled water, weighing the undissolved portion, and evaporating also an aliquot portion of the filtrate to complete dryness. The results were as follows:

No. 1.	Water,	8.53	per cent.	; sulphuric acid,	13.46	per cent.	; soluble in	20.40	water.
No. 2.	"	8.02	"	"	13.52	"	"	20.61	"
No. 3.	"	8.38	"	"	13.46	"	"	20.61	"
No. 4.	"	7.80	"	"	13.59	"	"	21.66	"
No. 5.	"	8.53	"	"	13.46	"	"	20.55	"

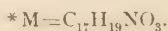
—Amer. Jour. Pharm., Jan. 1886, 13, from the author's thesis.

Morphine Lactate—Characters, etc.—Mr. D. B. Dott describes lactate of morphine. The salt crystallizes from its aqueous solution in four-sided prisms, in this respect resembling all other morphine salts which the author has examined. One part of the salt was found to be soluble in 8 parts of water, but required 93 parts of rectified spirit. The composition of the salt, as crystallized from water, was determined to be $C_{17}H_{19}NO_3, C_3H_6O_3$.—Pharm. Jour. and Trans., May 15, 1886, 958-959.

Morphine Salts—Relative Doses.—Mr. D. B. Dott contributes the following table, giving the percentages of morphine hydrate in different salts of morphine, and their relative doses:

Morphine Salt.	Formula.	Molecular Weight.	Morphine Hydrate, per cent.	Relative Dose.
Hydrochloride	* $M.HCl.3H_2O$	375.5	80.69	1.00
Sulphate	$\frac{1}{2}(M_2H_2SO_4.5H_2O)$	379.	79.94	1.00
Acetate	$M.C_4H_7O_2.3H_2O$	393.	75.93	1.04
Tartrate	$\frac{1}{2}(M_2C_4H_6O_6.3H_2O)$	384.	78.29	1.02
Meconate	$\frac{1}{2}(M_2C_7H_4O_7.5H_2O)$	430.	70.46	1.14

The doses of the morphine salts are thus shown to be practically identical. In the author's experience the salts of commerce correspond to the above formulas, thus being a slight exception in regard to the acetate, which generally contains a little free morphine, and is somewhat deficient in water of crystallization; but these conditions only bring it nearer to the morphine strength of the hydrochloride.—Pharm. Jour. and Trans., Jan. 30, 1886, 653-654.



Morphine Salts—Absence of Uniformity in Doses.—See *Opium*, under “*Materia Medica*.”

Apomorphine—Addition of Hydrochloric Acid to its Solutions to Prevent Change.—Mr. C. Bernbeck has observed that the addition of a small quantity of hydrochloric acid to solutions of apomorphine prevents the change to a green color. It has hitherto been supposed that this change was due to the influence of light, but the author's experiments convince him that the change to green is due to ammonia. This was made evident in the following manner :

A solution of apomorphine, prepared either with distilled water, or with syrup, or infusion of ipecac, etc., and containing a small quantity of hydrochloric acid, is mixed with highly diluted water of ammonia in drops until the reaction is alkaline. An emerald-green color will be the result. The same effect is produced if the solution is placed into a room in which ammoniacal vapors are present, but in this case the change of color takes place much more slowly.

For this reason, it appears to be advisable that solutions of apomorphine should be dispensed containing a slight excess of hydrochloric acid, and should not be kept in sick rooms or other places where ammoniacal vapors are liable to be given off.—*Amer. Drugg.*, March 1886, 52 ; from *Phar. Ztg.*, 1885.

Apomorphine—Anæsthetic Properties.—Messrs. Ludwig and Burgmeister find that the anæsthetic action of apomorphine equals, as far as the eye is concerned, that of cocaine, six to twelve drops of a two per cent. solution of crystalline hydrochlorate of apomorphine being found to render the cornea and conjunctiva anæsthetic within ten minutes after the instillation. There was always also moderate mydriasis. The solution, however, at first produced considerable pain and irritation, and, as might be expected, was always followed by marked nausea.—*Phar. Jour. and Trans.*, Oct. 3, 1885, 287 ; from *Therap. Gaz.*, Aug. 1885, 524.

Apomorphine—Alleged Presence in Old Solutions of Hydrochlorate of Morphine.—Mr. D. B. Dott, referring to the statement of Dr. Hager, that solutions of hydrochlorate of morphine are liable to form apomorphine (see *Proceedings*, 1885, 299), communicates the results of some experiments made with a view to determine the correctness of this statement. Having a sample of solution of hydrochlorate of morphine, just five years old, he applied the necessary tests, but obtained no proof whatever that apomorphine was present. Other experiments convince him that no such change takes place. For testing solutions suspected to contain apomorphine, the author recommends that the solution be rendered distinctly alkaline with carbonate of sodium, and then agitated with ether. The ether is separated, acidified with hydrochloric acid, and evaporated. The residue is dissolved in the least quantity of water, and

rendered alkaline with bicarbonate of potassium. If a green color is not developed in ten minutes, either there is no apomorphine present, or the proportion is less than 1 in 100,000. If the result is positive, the well-known other tests are applied. The author found hydrochlorate of apomorphine to be soluble in 50 parts of water at the ordinary temperature.—*Yearbook of Pharmacy*, 1885, 418-420.

Codeine—Characteristic Test.—Mr. Lafon recommends as a new and characteristic test for codeine a solution of 1 gram of selenite of ammonium in 20 cc. of strong sulphuric acid, which gives a magnificent green color with traces of codeine and is said to be sufficiently delicate to allow the detection of one tenth of a milligram of the alkaloids. The author states that none of the alkaloids or glucosides in ordinary therapeutic use give this reaction, the only near approach being by morphine.—*Compt Rend.*, c. 1543; *Pharm Jour. and Trans.*, Aug. 1, 1885, 107.

Codeine and Morphine—Reaction with Selenite of Ammonium.—It is stated in "Comptes rendus" (c. 1543) that a solution of 1 gram of ammonium selenite in 20 cc. of sulphuric acid gives with codeine or morphine a beautiful green color, which, on the absorption of moisture, changes to reddish brown. A similar but less distinct reaction is obtained with a solution of sodium selenate in sulphuric acid. A number of alkaloids and glucosides were tested in the same manner, but did not give this reaction.

Hydrochlorate of Thebaine—Value as a Myotic.—According to Dr. Bono, the hydrochlorate of thebaine is an excellent myotic, similar to eserine, but producing less spasm and myosis. One drop of a 1:40 solution produces its effect in half an hour, the effect passing off in four or five hours.—*Les Nouv. Remèdes*, March 1, 1886.

Cinchona Alkaloids—Alleged Occurrence in the Genus Artemisia.—In an English patent, issued to P. Giacoso, the remarkable statement is made that the alkaloids of Peruvian bark occur in plants of the genus *Artemisia*, from which they can be extracted either in the ordinary manner, or by a process described by the patentee.—*Amer. Drugg.*, July 1885, 128.

Cinchona Alkaloids—Manufacture in Madras.—Hitherto Madras has been dependent upon Bengal for its supply of cinchona alkaloids; but since the appointment of Mr. Hooper as government quinologist in Madras, it has been decided to carry out the manufacture there. Mr. Hooper has recently visited the Medical Store Depot, and after an inspection of the laboratories, found that the appliances could be adapted to the manufacture of the liquid cinchona on a larger scale. The cost, taking the bark at the rate of the recent sales at Madras, and allowing the usual percentage for fuel, labor, etc., was estimated at 1.0.9r. per fluid pound. This will enable it to be issued at a price of some 30 per cent.

lower than the febrifuge now obtained from the government factory in Bengal for use in the hospitals and dispensaries at this Presidency. Mr. Hooper has been instructed to manufacture at once 1,000 lbs. of fluid extract at 40 grs. to the ounce.—*Amer. Drugg.*, Sept. 1885, 173; from *Chem. and Drugg.*

Cinchona Alkaloid.—*Determination in Liquid Extract of Cinchona*, which see under "Pharmacy."

Quinine—Action of Lime.—Some years ago Masse announced that quinine was partly decomposed by lime at the temperature of 100° C. This statement was afterward controverted by Passmore, and even by Prof. Fresenius. Mr. A. R. Haslan now again investigated the subject. He operated on 4 gm. of the best obtainable sulphate of quinine, containing 12.85 per cent. of moisture, and—as the author continues—"thus equal to 3.48 gm. of pure anhydrous sulphate." This was dissolved in 100 cc. of a 2 per cent. hydrochloric acid. The solution was then divided into portions of 10 cc. each, each representing 0.348 gm. of sulphate of quinine. To each of them 5 gm. of hydrate of lime were added; five of the solutions thus prepared were evaporated to dryness over sulphuric acid, and the other five on a water-bath. All of them were then completely exhausted by ether in a continuous extraction apparatus. In all the five experiments in which heat was employed, the author found a considerable difference in the quantity of alkaloid found and that which should theoretically be the yield, and which, though never in his experience exceeding 6 per cent. (considerably below Masse's result), is yet sufficient to confirm the latter's opinion. The following table exhibits the results of the experiments:

	Loss. Heated to 100° C.	Loss. No heat used.
1.	0.018	0.001
2.	0.016	0.004
3.	0.021	0.002
4.	0.021	0.002
5.	0.017	0.001
	Average, 0.018	0.002
	Average, 5.1%.	

It would also appear that lime decomposes quinine at a much lower temperature than 100° C., as 1 gm. of sulphate, when exposed for four hours to a temperature of 70° C., and then evaporated to dryness over sulphuric acid, was found to have lost 0.032, or 3.2 per cent.—*Amer. Drugg.*, Oct. 1885, 183; from *Chem. and Drugg.*

Quinine—Application of Kerner's Test.—Prof. F. B. Power draws attention to the fact that the U. S. Pharmacopœia directs an insufficient quantity of water with which to shake the quinine salt in carrying out

Kerner's test. Experiments made at his suggestion by Mr. Henry G. Ruenzel show that in carrying out the pharmacopœial test with alkaloidal quinine as the starting point, only 3 cc. of filtrate—instead of 5 cc. required—could be obtained; starting with bisulphate of quinine, only 2 cc. filtrate were obtained; with hydrobromate of quinine, between 2 and 3 cc., and with hydrochlorate of quinine, about 1 cc. was obtained. The test as applied to the sulphate, being the original test of Kerner, no change is required. The author suggests the necessity of increasing the quantity of water to be added to the quinine sulphate formed in each case: in the case of the *alkaloid* from 10 cc. to at least 13.5 cc.; in that of the *bisulphate* to 20 cc.; of the hydrobromate from 15 cc. to practically 30 cc.; and the same increase in the case of the hydrochlorate.—Contrib. Dep. Pharm., Univ. Wisc., No. 1, 1885, 11-17.

Quinine—Estimation in Mixtures of Quinine Alkaloids.—Mr. Y. Shimoyama describes a method for the estimation of quinine in mixed alkaloids, which is founded on the relative solubilities of the oxalates of the quinine alkaloids: Quinine oxalate dissolves in 1446 parts of water at 18°; cinchonidine oxalate in 228 parts at 15°; quinidine oxalate in 151 parts at 15°, and cinchonine oxalate in 104 parts at 10°. The precipitation is effected by adding sodium oxalate to a dilute neutral solution of the alkaloids, and correction must be made for the amount of quinine oxalate remaining in solution.—Jour. Chem. Soc., 1885, 935; from Arch. Pharm. (3) xxiii., 209-229.

Quinine Hydrate—Composition.—Considerable uncertainty existing as to the proportion of combined water in the molecule of quinine, when the alkaloid is obtained by different methods and subjected to varying conditions in the process of drying, Mr. F. W. Fletcher communicates the results of his experiments in this direction. He finds that quinine, as obtained by precipitation with ammonia, and allowed to dry in the air, without the aid of heat, until it ceases to lose weight, has the composition of a monohydrate, and not a hydrate, as has been sometimes supposed. The alkaloid residue of an ethereal solution of quinine becomes constant in weight, if dried by exposure to the air at ordinary temperatures, and under these conditions it approximates closely to that of a monohydrate. Dried over sulphuric acid, the same residue remains constant in weight, and likewise contains one molecule of combined water.—Pharm. Jour. and Trans., Nov. 7, 1885, 385.

In view of the above observations of Mr. Fletcher, Professor Flückiger, who in his "Pharmaceutische Chemie" (1878, 407) had stated the composition of hydrate of quinine to be $C_{20}H_{21}N_2O_2 + 3OH_2$, felt obliged to submit the question to a new examination, in doing which he was assisted by Mr. Ditzler. The results of this reinvestigation, which are given in some detail, show that the *only crystallized hydrate* of quinine as yet known is the

trihydrate; an *amorphous trihydrate* of quinine is also obtained by precipitating sulphate of quinine with just sufficient ammonia water, washing and drying at $10^{\circ}\text{C}.$; on heating to $120^{\circ}\text{C}.$ until it ceased to lose weight, it parted easily with 3 mol. of water. A *monohydrate* as described by Mr. Fletcher could not be obtained, but by particular manipulation a hydrate containing 2 mol. of water could be readily obtained. This latter hydrate, as well as those containing 8 mol. of water (obtained by Hanamann), or 9 mol. of water (obtained by Oudemans) the author raises the question as to their being really true chemical compounds.—Pharm. Jour. and Trans., April 24, 1886, 897.

Quinine Hydrate—Amount of Water of Hydration.—Referring to Mr. Fletcher's statements, Dr. O. Hesse states that he has also made further examination of the subject, and has arrived at results which corroborate those published by Professor Flückiger. As is well known, the alkaloid obtained by precipitation with ammonia from a solution of a quinine salt is generally regarded as being a trihydrate. The author's own experience, however, tends to show that quinine as precipitated by ammonia from solutions of it in dilute acids, or of its salts in water at the ordinary temperature, is at first amorphous and apparently anhydrous; but that it soon takes up water and at the same time becomes crystalline. The hydrate that has in this way become perfectly crystalline contains in all cases three molecules of water. If precipitated with large excess of ammonia the trihydrate is obtained in small needles. From some solutions, and particularly from ether when evaporated at a temperature not exceeding $10^{\circ}\text{C}.$, it is obtained in long needles. Under a bell-jar over strong sulphuric acid it loses the whole of its water at $20^{\circ}\text{C}.$; but by using a less concentrated acid it loses under the same conditions only 2 molecules of water. It is possible, therefore, that a monohydrate of quinine does exist. On a manufacturing scale the author has obtained a hydrate that contains water approximating to 2 molecules.—Phar. Jour. and Trans., May 8, 1886, 937.

Sulphate of Quinine—Preparation of a Pure Salt.—Mr. Robert H. Davies being desirous of securing a perfectly pure sulphate of quinine, had recourse to the methods that have been proposed by Dr. O. Hesse, *i. e.*, repeated crystallization from the commercial salt. He found, however, that by continuing the recrystallization beyond the point recommended by Dr. Hesse, a salt was obtained having a greater rotatory power than that assigned by Dr. Hesse, and that this salt agreed in its specific rotation with that of pure sulphate of quinine as described by Dr. Oudemans. On the other hand a very pure salt was obtained by making the acid sulphate of quinine, crystallizing this, precipitating the quinine from one-half of crystals of acid sulphate obtained, and uniting the quinine hydrate with the other half so as to produce the normal sulphate. With sulphate of quinine so prepared and sulphate of cinchonidine admixed in known

proportions, the author obtained results that justify him in the conclusion that by Dr. Hesse's method of purification the sulphate of quinine still retains a certain proportion of sulphate of cinchonidine.—*Yearbook of Pharm.*, 1885, 439-449.

To the above observations of Mr. Davies, Dr. O. Hesse makes a brief reply in which he points out a number of errors in that gentleman's observations, and maintains the correctness of his former assertion that two recrystallizations from boiling water are sufficient to deprive commercial sulphate of quinine of any sulphate of cinchonidine it may contain.—*Pharm. Jour. and Trans.*, March 27, 1886, 818-819.

Sulphate of Quinine—Percentages of Sulphate of Cinchonidine in the Commercial Article—In view of the statement of Dr. de Vrij that all the sulphate of quinine of commerce contains more than 5 per cent. of sulphate of cinchonidine, Mr. A. J. Cownley is led to observe that this statement is not borne out by the experience of those conversant with the subject, and he communicates some results obtained in the examination of commercial sulphate of quinine in the course of the last ten years. These results are given in the form of two tables, the one comprising 28 samples, the other 12 samples; those embraced by the last table being samples of known inferior quality. Of the first 28 samples, 7 contained no cinchonidine at all, 2 contained traces, 4 contained less than 1 per cent., 3 contained between 1 and 2 per cent., 1 contained between 2 and 3 per cent., 3 contained between 3 and 4 per cent., 6 contained between 4 and 5 per cent., and 2 contained between 5 and 5.5 per cent. Of the 12 inferior samples, 2 contained from 5 to 6, 3 from 6 to 7, 3 from 7 to 8, 3 from 8 to 9, and 1 contained 13.9 per cent. of sulphate of cinchonidine. Mr. Cownley expresses the opinion that Dr. de Vrij has been misled by the method adopted, a certain optical method which is not accepted as giving accurate results.—*Pharm. Jour. and Trans.*, March 20, 1886, 797.

Sulphate of Quinine—Test of Purity.—Prof. Chas. O. Curtman reviews the officinal (Kerner's) as well as Hesse's method for determining the purity of sulphate of quinine. The Pharmacopœia does not require that this salt be absolutely pure, but that it should contain only a minimum quantity of other cinchona alkaloids. The author draws attention to a possible source of error, both in the officina land in Hesse's process, which may be caused by the presence of *free* cinchona alkaloids, notably cinchonine. Such could, of course, not be present in a properly prepared salt, but might be fraudulently added, in which event, in the case of alkaloidal cinchonine, this alkaloid would remain completely undissolved during the digestion of the sample with water together with the excess of sulphate of quinine. On the other hand, the presence of an acid salt would necessarily lead to inaccurate results, inasmuch as the quantity dissolved during the digestion with water would be increased in proportion to the amount present. The absence of both acid salt and free al-

kaloid should therefore be determined by dissolving a portion of the sample in boiling water and testing with phenolphthalein, litmus, or rosolic acid. The author concludes his paper by a carefully prepared table, showing the solubilities of quinine, quinidine, cinchonine and cinchonidine, and of their sulphates, in cold and boiling water, alcohol, ether, chloroform, and officinal water of ammonia.—Pharm. Rundschau, Aug. 1885, 170-172.

Sulphate of Quinine—Source of Error in the Optical Test—The circumstance that Dr. de Vrij insists on the correctness of the optical method of testing sulphate of quinine for the presence of sulphate of cinchonidine, has induced Dr. O. Hesse to again determine the rotatory power of the tartrates of these alkaloids under the conditions laid down by Oudemans. The author's present results confirm his previous statements and observations. They show that while the optical method will very readily reveal the presence of cinchonidine in sulphate of quinine, there exists in the commercial sulphate a certain proportion of

Hydroquinine, which possesses optical relations similar to those of cinchonidine, and that the indications of the latter alkaloid by the optical method are increased 0.42 units for every 1.0 unit of hydroquinine present. It follows, therefore, that the amount of sulphate of cinchonidine is generally indicated too high by several units per cent. by the optical method, and the author mentions instances in which the optical method has given data indicating the presence of some two per cent. of sulphate of cinchonidine in material that did not contain a trace of it.—Phar. Jour. and Trans., June 5, 1886, 1025-1026.

Sulphate of Quinine—Loss in Weight when Packed in Cans.—Mr. W. A. Spalding weighed the contents of two cans of sulphate of quinine and repeated the weighings at intervals extending over periods of twelve months in the first, and eight months in the case of the second. He observed a constant loss, which in the instance of the first case amounted to a total of between 8 and 9 %, in the case of the second can to 11.39 %.—Proc. Conn. Phar. Assoc., Feb. 1886.

Tannate of Quinine—Preparation.—An almost tasteless tannate of quinine is obtained by dissolving 60 gm. tannic acid in 11 gm. of water, without heat, and adding 11 gm. of a 2 per cent. solution of sodium bicarbonate, and enough water, if necessary, to make a clear solution. To this solution is added a solution of 40 gm. quinine sulphate in 27 gm. of dilute sulphuric acid and 11 gm. of water. The precipitate is washed on a linen strainer until the washings cease to have an alkaline reaction; it is then dried and powdered. Prepared thus, tannate of quinine contains about 33 $\frac{1}{3}$ per cent. of quinine, and is cheaper than the commercial article, which frequently contains but 20 per cent. of quinine.—Amer. Jour. Phar., Nov. 1885, 550, from Pharm. Centralhalle.

Hydroquinine—Therapeutic Action.—Dr. Seifert has studied the therapeutic action of *hydroquinine*, one of the alkaloids obtained by Dr. Hesse from the mother liquors obtained in the manufacture of quinine (see Proceedings 1882, 405). The author finds it to be an antipyretic superior to salicylic acid and kairine, reducing the pulse and the temperature with abundant transpiration. The dose is about the same as that of sulphate of quinine, and its continued use is not attended with disagreeable effects.—Phar. Jour. and Trans., May 29, 1886, 1005.

Cupreine—Individuality and Distinction from Homoquinine.—Dr. O. Hesse has contributed some additional details of the chemical history of cupreine and homoquinine, as well as the results of further investigations undertaken for the purpose of satisfying himself as to the individuality of the alkaloid obtained from cuprea bark by Messrs. Paul and Cownley and called by them cupreine (see Proceedings 1885, 309). The author in repeating these experiments was able to confirm their results in all essential particulars. He had missed the detection of cupreine, from the circumstance that he believed the formation of crystals in his solutions to be due to an alteration of the homoquinine in operation. His subsequent experiments, however, led him to infer that homoquinine is not an independent alkaloid, as Messrs. Paul and Cownley were inclined to think, but merely a compound of quinine with cupreine; and recent experiments cause him to still regard this as the more probable view of the nature of homoquinine.—Pharm. Jour. and Trans., Jan. 30, 1886, 641; from Annal. d. Chem.

Strychnine—Detection in Cases of Poisoning.—Mr. T. Chandelon recommends the following method of isolating strychnine in poison cases as more convenient than the method of Star, and very accurate. The method is applicable to other alkaloids. The intestines, etc., are cut up very finely, mixed with an equal weight of well-burned gypsum, and the whole well rubbed in a mortar until a perfectly homogeneous mass results. This sets in 4 to 5 hours, when it is easily broken up into fragments. These are dried either in a water- or air-bath at 70°, pulverized, and the powder boiled with 90 per cent. alcohol, to which some tartaric acid is added. When the powder has been boiled for an hour in a large flask connected with a reflux condenser, it is filtered, and the residue washed with hot alcohol. If the reaction of the filtrate is not acid enough, tartaric acid is added and the whole distilled. When the bulk of the alcohol is distilled off, the remainder is expelled by evaporation to dryness on the water-bath, the residue is taken up with a little boiling water, and left to cool in order to separate the fat. The filtrate, which should be about 20 to 25 cc., is made decidedly alkaline with soda and transferred to a large watch-glass, mixed with gypsum, allowed to set, powdered, dried in an exsiccator, and then extracted with chloroform in a large Soxhlet's apparatus. The chloroform extract is brought to a small

volume, 10 to 15 cc., filtered if necessary, and the extract treated with an equal volume of a saturated solution of oxalic acid in ether. Fine acicular crystals of strychnine oxalate soon appear; the oxalate is collected on a filter, washed with a mixture of equal parts of alcohol and chloroform, dried and dissolved in the least possible quantity of water, and the strychnine precipitated by addition of ammonia.

By this method the author has recovered strychnine from a frog killed by a subcutaneous injection of 0.01 gram, from the liver of a rabbit killed by subcutaneous injection of 0.04 gram of the sulphate, and from the stomach of a cat killed by eating flesh containing 0.03 gram of strychnine. The author made experiments with brucine, narceine, papaverine, thebaine, morphine, aconitine, atropine, hyoscyamine, veratrine, nicotine, conine, and colchicine; two of these, morphine and colchicine, were not soluble in chloroform, the others were completely precipitated as oxalates. The precipitate took some hours to form in the case of strychnine, brucine, narceine, codeine, nicotine, and conine; for the remainder 24 hours were necessary. The precipitate was crystalline in every case except that of aconitine, which was amorphous. In the case of brucine, nicotine, veratrine, and atropine, which are not completely precipitated by ammonia, the oxalate is dissolved in alcohol, the oxalic acid is precipitated by a little alcoholic potash, filtered off, and the potash removed by a stream of carbonic anhydride; after frequent filtration, the alcohol is allowed to evaporate spontaneously, and the pure alkaloid remains.—*Amer. Jour. Pharm.*, Aug. 1885, 396-397; *Zeitschr. Physiol. Chem.* (9), 40-48; *Jour. Chem. Soc.*, 1885, 605.

Strychnine—Reliable Test.—Prof. Flüchiger recommends the following as a reliable test for the presence of strychnine: Dissolve 1 centigram of chromate of potassium in 5 cc. of water, and add 15 grams (8.15 cc.) sulphuric acid of sp. gr. 1.84 at 15° C. Suspected solids are sprinkled with it on a porcelain plate, when, if strychnine is present, the characteristic blue coloration is produced. If the strychnine is in solution, a distinct blue zone is obtained by dropping the suspected solution into the reagent. Several substances prevent the formation of the blue color. A mixture of equal parts of strychnine and brucine only shows the brucine (red) coloration when treated with the reagent. The strychnine test is applicable only when there is at least ten times as much strychnine as brucine present.—*Amer. Jour. Pharm.*, March 1886, 128; from *Pharm. Zeitung*, 1886, xxxi, p. 10.

Strychnine, Gelseminine, Hydrastine and Berberine—Color Reactions.—Dr. A. B. Lyons has made a series of experiments respecting the color reactions produced by oxidizing agents upon the following alkaloids:

Strychnine.—The characteristic colors developed by oxidizing agents applied to its solutions in sulphuric acid are, indigo blue, purple, violet,

giving place to a rather permanent pale red. The acid must be 66 to 80%.

Gelseminine.—With the same reagents a rather transient purple color is developed, not preceded in any case by indigo blue, nor changing generally to red. Some specimens of gelseminine dissolve in the sulphuric acid in the first instance to a yellow reaction, and produce, not a purple, but a deep red or even maroon, the colors being very similar to those produced normally by hydrastine. The acid must be 75 or 80%.

Hydrastine.—This produces its characteristic color, crimson, preceded by brown, sometimes with an initial green.—The acid must be 66 to 80%.

Berberine produces an intense purple color, generally preceded by a brown, and rather persistent, in contrast with that produced by pure gelseminine, and the colors are developed in acid of 40 or 50%.—West. Drugg., March 1886, 73-75.

Strychnine—Separation from the Animal Organism.—Prof. P. C. Plugge communicates an extensive series of experiments undertaken with a view of determining the changes which strychnine is liable to undergo in the animal organism. His results show that the greater part of the alkaloid passes through the animal organism unchanged, and that distinct indications of its presence are obtained in the urine within two hours after it has been administered, and that unchanged strychnine may be found in the urine 8 days after a dose has been taken. The most sensitive test for strychnine he finds to be *Sonnenschein's* reagent, which will indicate as little as 0.000005 gram of the alkaloid. He finds chloroform to be the best solvent for the strychnine, a quantity of 0.0005 gram in 400 cubic centimeters of urine being readily determined by its aid. The author finds that by oxidation a product is formed which is not poisonous, and possesses the characters of an acid. This he has named

Strychninic Acid.—This compound, if introduced into the system, will be found in the urine after two hours, and is not changed during its passage through the animal organism. The most sensitive test for its presence is protoxide of cerium in sulphuric acid, 0.00001 gram of the acid being readily detected.—Arch. d. Pharm., Nov. 1, 1885, 833-848.

Citrate of Strychnine—Composition and Solubility.—Mr. Frank H. Fishedick has made a series of investigations by which he determines citrate of strychnine to crystallize in two distinct forms—the one in the form of small, thin, micaceous plates, placed one above the other, transparent, and having a pearly lustre; the other composed of small, needle-shaped crystals, radiating from one point to form silvery-white cones, which appeared fan-shaped when seen from the sides. The first variety of crystals contained 4 mol. and the second 2 mol. of water of crystallization, the composition of the two forms being respectively:

$(C_{21}H_{22}N_2O_2)_2C_6H_8O_7 \cdot 4H_2O$, and $(C_{21}H_{22}N_2O_2)_2C_6H_8O_7 \cdot 2H_2O$. The crystals of the first form were found to be soluble in 45.5 parts of water and in 143.83 parts of alcohol at $15^\circ C$. The author's paper is accompanied by a cut showing the two forms of crystals.—Contrib. Dep. Pharm. Univ. Wisc., No. 2 (1886), 49-52.

Chromates of Strychnine—Preparation and Characters.—Mr. Franz Ditzler has prepared and examined the neutral and acid chromates of strychnine, which had hitherto been described only by Nicholson and Abel, (1849).

Neutral Chromate of Strychnine is obtained as an amorphous, reddish-yellow precipitate when a saturated solution of neutral chromate of potassium is added to an excess of a saturated solution of a neutral strychnine salt. It may be obtained in the form of a crystalline precipitate from dilute solution; the salt obtained by precipitation from concentrated solution may be obtained in handsome yellow needles by dissolving it in boiling water and allowing the solution to cool. It contains no water of crystallization, requires 469 p. of water at $18^\circ C$. and 171 p. boiling water, and appears to be completely insoluble in alcohol, in ether, and in chloroform.

Acid Chromate of Strychnine is obtained like the above, substituting a saturated solution of bichromate of potassium for one of the neutral chromate. The reddish yellow precipitate becomes crystalline on standing in the mother liquor, or may be obtained crystalline from boiling water, crystallizing in reddish-yellow anhydrous needles. It requires 1815 p. of water at $18^\circ C$., and 243 p. at the boiling temperature, and is insoluble in absolute alcohol, ether and chloroform. Like the neutral salt, this acid salt is readily browned when exposed to the light.—Arch. d. Pharm., Feb. (1) 1886, 103-109.

Strychnine Salts—Paraldehyde an Antidote.—See under "Alcohols, etc."

Curarine—Probable Identity with the Alkaloidal Constituent of Guaiacum (Malonetia Nitida), which see under "Materia Medica."

Aconitine—Characters.—The experiments of Mr. A. Juergens lead him to give the following characteristics of aconitine: It crystallizes in anhydrous forms which vary with the nature of the solution from which they have been obtained, whilst from aqueous solution the aconitine separates in the amorphous form. It is soluble in about 64 p. absolute ether, 37 p. absolute alcohol, 2800 p. light petroleum of 0.670 sp. gr., 5.5 p. chloroform or benzin, and 750 p. water. Pure aconitine does not give color reactions with phosphoric acid, sulphuric acid and sugar, or phosphomolybdic acid and ammonia, etc., the colors described by some authors being due to resinous substances in the impure material. Aconitine can, however, be readily detected under the microscope as follows:

A minute quantity is dissolved in water, acidified with acetic acid, and a particle of iodide of potassium is added; on allowing the solution to evaporate, characteristic crystals of hydriodide of aconitine, which remains after dissolving out the simultaneously formed crystals of iodide of potassium with water. The alkaloidal reagents act upon aconitine solutions as follows: Iodine water, a reddish-brown precipitate in a solution of 1:20,000. Potassio-mercuric iodide, a precipitate in 1:10,000. Brominated bromide of potassium, potassio-bismuthic iodide, and iodinized iodide of potassium, behave similarly. Chloride of gold, phosphomolybdic acid, and phosphotungstic acid, indicate aconitine in solutions of 1:5,000; picric acid in 1:4000, and tannin and nitrite of potassium in 1:2000. An alcoholic solution of aconitine reduces nitrate of silver, but its salts do not have this effect. Analysis of aconitine indicates the formula $C_{33}H_{47}NO_{12}$.—*Jour. Chem. Soc.*, June 1886; *Arch. d. Pharm.* (3), xxiv. 127-172.

Aconitines—Comparative Physiological Action.—Messrs. Buntzen and H. P. Madsen have made comparative physiological experiments with the different aconitines upon frogs. Gehe's amorphous aconitine was found to be the most powerful. Next in strength were some preparations made by Mr. Madsen from Vosges roots; then the crystalline aconitine of Gehe, Petit and Merck, and afterwards preparations made by Mr. Madsen from Swiss roots. A sample of Duquesnel's aconitine gave far less effective results than those reported by other observers, but the authors are inclined to attribute this to deterioration through keeping, and consider that preparations bearing the same name may differ sensibly from this cause. Contrary to the experience of Messrs. Laborde and Duquesnel, the authors found the aconitine from the Vosges roots more powerful than that from Swiss roots, though the former required several crystallizations to bring out its activity; and it is suggested that the difference in strength will be frequently dependent on the facility with which the alkaloid can be separated from inactive substances. Great differences were observed also in different samples of aconitine prepared from Japanese roots, one made by Mr. Madsen being fairly powerful, while a commercial specimen was very weak. Aconitine prepared from bisk root proved inferior in quality, which may have been due to the roots having been submitted to the action of heat. But notwithstanding these variations in the aconitines examined, the authors consider that the alkaloid should be used in preference to galenical preparations, but that medical men should require the control of the aconitine of commerce by competent persons.—*Pharm. Jour. and Trans.*, Oct. 31, 1885, 366.

Alkaloids of Belladonna.—Determination in the Extract of the Root, which see under "Pharmacy."

Atropine—Relative Value of "Crude" and "Refined" Alkaloid.—Dr.

A. B. Lyons records a series of experiments which seem to prove very conclusively that the view entertained by Dr. E. R. Squibb (*Ephemeris*, Sept. 1885), that crude atropine is medicinally more active than pure atropine, is quite incorrect. Dr. Lyons finds, on the contrary, that pure atropine exerts marked uniformity of action in the various conditions in which it was presented in the experiment.—*Drugg. Circ.*, Jan. 1886, 2-3.

Atropine—Alkaline Power towards Phenolphthaleïn and Mercuric Chloride.—Referring to the papers of Mr. A. W. Gerrard (see *Proceedings* 1884, 318), and of Mr. Schweissinger (see *Proceedings* 1885, 317), in which these authors showed that atropine and certain others of the mydriatic alkaloids possessed alkaline power sufficiently strong to precipitate mercuric oxide from mercuric chloride solutions, Professor Flückiger details the results of some experiments made which completely confirm the observations of the above named authors. In a former communication, also (see *Proceedings* 1885, 338), Prof. Flückiger had expressed the opinion that, unlike the alkalies, the alkaloids were incapable of reducing solutions of phenolphthaleïn. He had, however, not tried atropine, and now finds that this alkaloid is an exception, since it is perfectly able to redden phenolphthaleïn paper. He finds, furthermore, that other coloring matter, such as cyanine, methyl-orange, phenacetolin, and tropæolin, are acted upon by alkaloidal atropine in the same way as by soda and potash. As regards the action of atropine on mercuric chloride, he finds the action to be that pointed out by Mr. Gerrard. On the other hand, mercurous chloride (calomel) is not blackened by atropine as it is by soda, potash and ammonia, as well as *pyridine*, which latter, however, has no action on phenolphthaleïn. *Homatropine* and *hyoscyamine* show the same behavior as atropine with regard to phenolphthaleïn.—*Phar. Jour. and Trans.*, Jan. 16, 1886, 601-602.

Atropine—Reaction with Mercurous Chloride.—The statement in the above paper of Prof. Flückiger that atropine is devoid of the power to decompose calomel (*i. e.* to blacken it) leads Mr. A. W. Gerrard to a rejoinder in which he shows that mercurous chloride, like the mercuric, is decomposed by alkaloidal atropine. He states that when pure atropine in powder is shaken with mercurous chloride and cold water no action is apparent, but as soon as the mixture is warmed the white mercurous salt becomes almost black. The development of the reaction is physically aided by adding to the mixture one-fourth its volume of alcohol, which by its solvent action on the atropine promotes contact with the mercurous salt. When the atropine is added to a soluble mercurous salt, such as the nitrate or acetate, the black precipitate is immediately formed in the cold. The author gives the details of some experiments made to determine the nature of the decomposition, which clearly prove that atropine simply acts on both mercurous compounds as a precipitant, as do the alka-

lies, and that no double compound is formed. Finally, the author gives a method for applying the reaction observed as a test for atropine.—Phar. Jour. and Trans., March 6, 1886, 762.

Salicylate of Atropine—Superiority over the Sulphate.—It is stated in "Progresso" that neutral salicylate of atropine is a more valuable salt than the sulphate, and superior to the latter. Its preparation is not difficult, but the exact neutralization is very important. The necessary proportions are: Atropine 2.30 gm., salicylic acid 1.08 gm., and sufficient alcohol, but exact neutralization should be insured by testing with delicate test-paper. Dissolve the atropine in the alcohol by means of a gentle heat, add slowly in minimal quantities the salicylic acid until absolutely neutralized, and filter if necessary. Evaporate carefully over a steam or water-bath to a syrupy consistence, and dry at a very gentle heat. The powder is hygroscopic, and the watery solution (as most of the alkaloids) very unstable on account of the formation of a species of algæ (*Leptomitia Hicrocrocis*).—Amer. Jour. Pharm., Aug. 1885, 384; from Ph. Ztg., No. 41, 1885.

Atropinum Santonicum—Value in Ophthalmic Practice.—Mr. Bombelon describes this compound of atropine and santonic acid as occurring in form of a white, amorphous, non-hygroscopic powder. A dilute solution may be prepared with cold water; a stronger solution requires the aid of heat. Its solutions should be preserved in yellow glass bottles. The author recommends the new compound as presenting advantages over any other salt of atropine for ophthalmic purposes, a solution of it being perfectly non-irritating and not liable to fungoid growths. The mydriatic action equals that of atropine, is mild, and resembles that of homatropine.—Pharm. Jour. and Trans., May 1, 1886, 919; Pharm. Ztg., April 14, 1886, 280.

Atropine and Cocaine—Decomposability by the Prolonged Action of Boiling Water.—Professor Flückiger, in view of his observations made on the action of alkaloidal atropine upon phenolphthalein, has experimented with cocaine in the same direction. He has found that some samples of cocaine would readily redden phenolphthalein paper, and others, apparently pure, would not. Experiments made to determine the cause proved that cocaine is very readily decomposed when heated with water to boiling for some time. The residue of evaporation is then no longer alkaline, but has an acid reaction, probably through conversion into ecgonine and benzoic acid. When the experiment is conducted in sealed tubes, and the heating at 100° C. is prolonged for a week, the contents of the test tube become strongly acid. The same experiments were repeated with atropine, which, when heated in sealed tubes for a week, was likewise decomposed. The products of decomposition, however, did not redden litmus, as in the case of the cocaine, but

it no longer displayed an alkaline reaction either on litmus or on phenolphthalein. Neither did it produce a precipitate in solution of mercuric chloride.—*Pharm. Ztg.*, March 20, 1886, 800.

Cocaine—Credit of Discovery.—According to Mr. C. Torretti, formerly director in the laboratory of la Botica y Drogueria Boliviana, at La Paz, Bolivia, the honor of discovering cocaine belongs to his predecessor in that laboratory, Mr. Pizzi, who subjected the leaves to examination in 1857, at the suggestion of the celebrated Austrian traveler, Tschudy. The latter and Dr. Aguile Reid, of Valparaiso, are mentioned as being able to confirm Mr. Torretti's statement. The discovery, therefore, antedates that of Niemann, who prepared cocaine in 1859.—*Ph. Jour. and Trans.*, Feb. 27, 1886, 721.

Cocaine—Quality of Leaves suitable for Extraction, etc.—Dr. Edward Polenske, who has been engaged in the manufacture of large quantities of cocaine, observes that in his experience the leaves that yield upon analysis a crystalline product, will also yield, upon proper manipulation, crystalline cocaine on the manufacturer's scale. The percentage of alkaloid in coca leaves varies from 0.05 to 0.75 per cent. The green Peruvian leaves, which have a delicate texture, contain possibly a larger percentage of total alkaloid, but relatively a smaller one of crystallizable cocaine than the brown leaves, which have a much coarser texture. He is of the opinion that coca leaves contain naturally only one alkaloid, and that the amorphous alkaloids found in the commercial leaves are products of decomposition of that alkaloid produced by the influence of air, moisture and heat, or of the treatment with acids or alkalies to which the leaves are subjected during the process of extraction. A second pre-existing alkaloid can only be present in traces. Regarding the

Hydrochlorate of Cocaine, the author observes that it crystallizes from its concentrated alcoholic solution in short, firm prisms, constituting a white crystalline powder. From dilute alcoholic solution it crystallizes in long, hard, friable needles. From aqueous solutions it is usually obtained in long, satin, glistening needles—often an inch in length—containing 2 mol. of water, which is lost at 100°C. The dehydrated salt absorbs water very slowly, and the dehydrated salt is not at all hygroscopic.—*Pharm. Rundschau*, Nov. 1885, 250–251.

Cocaine—Characters of Alkaloid and Salts.—Dr. A. B. Lyons, after referring to the character of the coca leaves of the market, the causes of their deterioration, and the character of the accompanying alkaloids, (see *Coca Leaves*, under "Materia Medica"), gives the characters which, in his experience, pertain to cocaine and some of its salts.

Pure Cocaine.—This should exhibit the following characters: colorless distinct crystals or a crystalline white powder, without odor, at first seeming to be tasteless, but, as it dissolves, developing a slightly bitter taste,

and producing numbness of the tongue ; wholly soluble in ether, soluble also in alcohol, chloroform, benzol, petroleum ether, bisulphide of carbon, in "petrolina" oil and melted petrolatum, and in the fixed and volatile oils ; nearly insoluble in water. It combines with acids, completely neutralizing them, and forming salts which are generally easily crystallizable.

Cocaine Hydrochlorate, although crystallizing easily, is often offered in the form of an amorphous powder, and such a product is not of necessity impure. The salt, however, should be nearly white, and wholly free from odor, and should show no disposition to absorb moisture from the air. It should dissolve easily and completely in water, yielding a colorless solution, neutral or very faintly acid to litmus paper, and having a saline, not a strongly bitter taste. A solution containing one grain to the fluidounce will produce a sensation of numbness in the mouth and throat if a few drops of it are swallowed. When treated with Froehde's reagent (sulphomolybdic acid) the salt should produce no immediate coloration ; impure products generally give a reddish-brown color, more or less rapidly fading. In a few cases a green color has been observed to develop subsequently. The salt dissolves in less than its own weight of water. It is also freely soluble in alcohol, less readily in absolute alcohol and in chloroform, and is practically insoluble in ether, in petroleum ether, and in fixed and volatile oils. The aqueous solutions yield by spontaneous evaporation acicular crystals, which, after drying over sulphuric acid, seem to be anhydrous. Crystals obtained from alcoholic solutions are certainly anhydrous. Their form is that of rhombic plates, but the crystals are generally very imperfectly formed.

Cocaine Hydrobromate.—This salt deserves to be better known. It crystallizes readily from aqueous solutions in slender transparent prisms which are permanent in the air. They contain two molecules (8.57 per cent.) of water of crystallization. The purity of the salt is at once manifest in its crystalline appearance, and there is no reason why it should not always be offered in the form of distinct crystals. It contains of course a smaller proportion of cocaine than the muriate (72.2 per cent. in the former, 89.25 per cent. in the latter), so that to produce the same effect a larger quantity will be required.

Cocaine Citrate has been employed to a limited extent in dentistry, but has no points of superiority over the muriate. It does not easily assume the crystalline form, and owing to its hygroscopic nature it is very troublesome to dispense. It can be formed into pellets for dentists' use without the addition of any excipient ; but by the use of a small amount of excipient the hydrochlorate can be made easily to answer the same purpose.

Cocaine Borate.—Cocaine combines with boric acid to form a crystal-

lizable salt rather sparingly soluble in water, which contains no more than 55 per cent. of the alkaloid, one molecule of base requiring apparently four of boric acid for neutralization.

Cocaine Sulphate.—With sulphuric acid, cocaine forms a salt which crystallizes easily in short six-sided prisms.

Cocaine Oxalate.—This may be mentioned as a salt of cocaine which crystallizes easily, and which may be obtained from an ethereal solution of the alkaloid by the addition of an ethereal solution of oxalic acid.

Cocaine Oleate.—Cocaine combines with oleic acid to form a readily crystallizable salt, which is much employed in the form of a solution in excess of oleic acid or in any bland oil. Where an oil is used it will be found necessary to employ in connection with it a certain proportion of oleic acid, or crystals of the cocaine oleate will separate from the solution in cold weather.

A more desirable preparation, perhaps, is a solution in a pure mineral oil of the alkaloid itself, and although there still exists a prejudice in the minds of some physicians against the use of mineral oils in liniments, ointments, etc., experience seems to show that this preparation at least is as active as a solution of the oleate of the same strength in oleic acid or in a vegetable oil.

As to the behavior of cocaine to reagents, it presents little that is distinctive. It does not give any color reactions of any importance. Its most characteristic peculiarity is the facility with which its molecule is split up, with formation of benzoic acid. For the identification of cocaine the organoleptic properties of the alkaloid are of the first importance. The benumbing effect upon the tongue (unlike that of any other substance), and the effect on the mucous membrane of the eye, are very striking.

The author finally gives the results of his studies of the behavior of solution of pure cocaine with the common reagents, viz., Mayer's reagent (capable of detecting very minute quantities), iodine in iodide of potassium, phosphomolybdic acid, tannin, picric acid, potassium bichromate, mercuric chloride, caustic alkalies, carbonates, and bicarbonates of the alkalies, platinum chloride, and gold chloride. The paper is illustrated by six cuts, showing the appearance of the salts as seen under the microscope. —*Amer. Jour. Pharm.*, Oct. 1885, 465-477.

Hydrochloride of Cocaine.—*Modification of Dr. Squibb's Process*.—Mr. De Lagnel Haigh communicates a modification of the process for preparing cocaine recommended by Dr. E. R. Squibb (see *Proceedings* 1885), for which he claims the following advantages: (1) By washing the chlorophyll residue after recovering the alcohol, the greater portion of the chlorophyll and resin is left behind at once. (2) There is a great saving of ether. (3) The yield is larger. (4) The process is much quicker, and

even with the present low price of cocaine allows a very fair margin of profit.

The author finds Dr. Squibb's assay process (*loc. cit.*) to give very good results. The following are some of the results obtained with different lots of coca :

No. of Lot.	Per ct. Alkaloid.
1	.3410
2	.6334
3	.6506
4	.5440
5	.6424
6	.5100
7	.2791
8	.6344
9	.2444
10	.3518
11	.5164
12	.6120
13	.5960
14	{ .9992
	{ 1.0220
	{ .9930

—Drug. Circ., March 1886, 54.

Cocaine—Preparation.—Truphème recommends exhausting the coca leaves with ether, distilling the ether, treating the remainder with boiling water, mixing with magnesia, and drying. The powder thus obtained is exhausted with amylic alcohol, which yields the cocaine somewhat yellowish; by recrystallization it is obtained colorless.—*Amer. Jour. Pharm.*, Sept. 1885, 436; from *Ann. di Chim. Med. Farm.*, and *Arch. d. Phar.*, 1885.

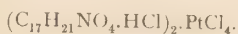
Cocaine—New Method of Preparation.—Prof. Bignon recommends the liquid hydrocarbons as solvents for cocaine. He proceeds as follows: Coca leaves are macerated about 48 hours in a solution of sodium carbonate (20°), then dried and placed in a percolator with benzin, and again allowed to stand 48 hours. All of the cocaine which has been isolated by the sodium carbonate will be dissolved by the benzin. The benzin solution is shaken with water acidulated with hydrochloric acid (1-10), thus forming cocaine hydrochlorate, which dissolves in the water. The coloring and resinous matter which has been dissolved by the benzin remains with the latter, the acid solution containing pure cocaine hydrochlorate.—*Amer. Jour. Pharm.*, Dec. 1885, 607; from *L'Union Pharmac.*, xxvi, p. 456.

Cocaine—Decomposition during the Process of Evaporation of its Aqueous Solution.—Dr. B. H. Paul, having found that the solubility of

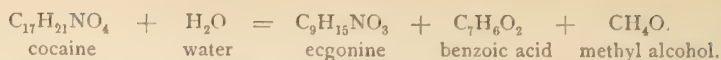
cocaine varied in different experiments, though approximating to the usual statements = 1 : 700, was induced to examine the residues of evaporation, and found them to contain but very minute traces of the cocaine originally employed. The residues were at first gummy, like melted cocaine, and after cooling they became crystalline much in the same manner as cocaine does; but they were always soluble in a comparatively small proportion of water, and the solution, after standing for some hours exposed in a warm room, furnished a mass of crystals closely resembling ammonium oxalate. From dearth of material the author has been unable to satisfy himself as to the precise nature of the substance; but it is unquestionably a product of the alteration of cocaine, and as it is formed by the mere evaporation of an aqueous solution, it is evident that in the preparation of the alkaloid there may be more than ordinary risk of decomposition. The characters described by the author as appertaining to the crystalline substance produced from cocaine by the action of water are in many particulars the same as those assigned to ecgonine. But, while in the well-known conversion of cocaine into ecgonine by hydrochloric acid, benzoic acid is always formed, the latter acid could not be detected in the product of alteration produced by water.—Pharm. Jour. and Trans., Oct. 17, 1885, 325–326.

Cocaine—Reproduction from Ecgonine.—Mr. W. Merck has made some further communication in reference to the reproduction of cocaine from benzoyl-ecgonine, the substance obtained by him as a by-product in the preparation of cocaine from coca leaves. As that substance differed from cocaine in containing hydrogen in place of the methyl group, it was probable that by the substitution of methyl for hydrogen, cocaine would be reproduced. By heating a mixture of methyl iodide, benzoyl-ecgonine and solution of caustic potash in methyl alcohol, some cocaine was formed, though at the same time some benzoic acid was formed from part of the benzoyl-ecgonine by the action of the caustic alkali. The formation of cocaine direct from ecgonine, however, by heating it with benzoic anhydride and methyl iodide, was also successful, though the amount produced was quite small. The synthetic production of cocaine from ecgonine cannot be regarded a success under the experience above noted.—Phar. Jour. and Trans., Dec. 26, 1885, 543; Ber. d. D. Chem. Ges., 1885.

Cocaine—Chemical Constitution.—Messrs. G. Calmels and E. Gossin have reëxamined the chemical constitution of cocaine, and their analysis of the chloro-platinate of cocaine leads to the formula



Lossen has shown that cocaine is split up, by concentrated acids, into ecgonine, benzoic acid, and methylic alcohol, thus:



This splitting up is now found by the authors to take place not only under the conditions mentioned by Lossen (heating in a closed tube with hydrochloric acid), but also by Kraut's method (heating in a closed tube with baryta). The products were under all circumstances identical with those given by Lossen.

From a series of investigations made with ecgonine, the authors conclude that there is a close relationship between the alkaloids tropine, cocaine, ecgonine, and isotropine.—*Amer. Drugg.*, July 1886, 131; from *Compt. Rend.*, c.

Cocaine Hydrochlorate—Presence of Water of Crystallization.—Dr. A. B. Lyons, referring to his above statement that hydrochlorate of cocaine formed apparently anhydrous crystals from aqueous solutions, corrects his previous statement, subsequent experiments having shown that this is not the case. The crystals which form in an aqueous solution contain in fact two molecules, or 9.6 per cent., of water of crystallization. Such crystals are now met with in commerce, commanding a higher price than the smaller anhydrous crystals, which have, of course, greater intrinsic value. Small crystals, also, are now met with, or a salt having only an indistinctly crystalline character, which contains either water of crystallization or hygroscopic moisture, to the amount of 6 or 8 per cent. of its weight.—*Am. Jour. Pharm.*, Dec. 1885, 596.

Cocaine—Characteristics of a Good Article.—Dr. Alfred Bignon gives the following characteristics of cocaine suitable for therapeutic uses: it should be white, almost inodorous, entirely soluble in three parts of alcohol, in 2 parts of sulphuric ether, in chloroform, in bisulphide of carbon, and in 20 parts of benzin prepared either from tar or petroleum.—*Phar. Jour. and Trans.*, Feb. 27, 1886, 721; from "*La Cronica Medica*," Lima.

Cocaine—Characters—Conditions of Activity, etc.—See *Coca and Cocaine*, under "*Materia Medica*."

Cocaine—Estimation by Means of Mayer's Reagent.—In continuation of his researches on cocaine, and its estimation in coca leaves (see above), Dr. Lyons communicates a lengthy paper on the use of Mayer's reagent in this connection, from which the following is abstracted:

It has been generally assumed that the precipitates produced by Mayer's reagent are double iodides of mercury with the alkaloidal base, having the general formula RI, HgI_2 —R standing for the alkaloidal basic radical. This theory, however, the author does not find borne out by fact in the case of most alkaloids, and certainly is not true of cocaine. The precipitates produced, indeed, appear generally to vary in composition under varying conditions, and it is only by accident that the equivalent

numbers originally given by Mayer, and quoted in all the text books, agree with those found by observation.

The use of Mayer's reagent offers, nevertheless, a ready means of ascertaining the alkaloidal strength of a complex fluid, of which the pharmacist may avail himself, when time and skill for carrying out an exact quantitative estimation are wanting. It is necessary, of course, to be familiar with the precautions to be observed in the use of the reagent, and to understand the sources of possible error. With a thorough knowledge of these, it may be possible to utilize Mayer's reagent in the practical examination of preparations of coca leaves, and the liability to error is perhaps no greater than in the case of most of the alkaloids estimated by its use.

When Mayer's reagent is added drop by drop to an acid solution containing cocaine (1 : 200 to 1 : 600) there is at first produced a heavy white precipitate which collects at once in curdy masses. After adding a certain quantity of the reagent, it will be found that the filtered fluid, which still gives a heavy precipitate with Mayer's reagent, produces a precipitate also in a fresh solution of cocaine. It is thus evident that precipitation is complete only when a certain excess of reagent is present in the fluid. If reagent is added until precipitation is just complete, it will be found that the fluid does in fact contain a considerable quantity of mercury. The author records a number of experiments which show generally that in all cases there was required for complete precipitation of the alkaloid an excess of reagent amounting approximately to 8.5 per cent. of the solution, and if the precipitate were washed with water not containing Mayer's reagent, it was appreciably dissolved. From a study of the results of numerous titrations, he deduced the following rule for interpreting the results of an experiment: 1. Correct the reading from the burette by subtracting, for each cc. of fluid present at the end of the titration, 0.085 cc. (if the half-strength reagent is used). The remainder multiplied by 10 will give the quantity of alkaloid indicated, in milligrams. If the Mayer's reagent of full strength is used, a correction of about 0.036 cc. would have to be applied for each cc. of fluid at the end of the titration, and the multiple would be 20 instead of 10.

In order that the results obtained shall be at all trustworthy, it is necessary that the reagent be added always in the same way. The first addition should not exceed two-thirds of the entire amount required, and the successive portions should consist of about 0.3 cc. at a time, until the end of the titration is approached. The use of alcohol must be avoided in all titrations with Mayer's reagent, for which, when the one-half strength is used, we may adopt the following equivalent values:

Strength of Cocaine Solution.	1 cc. of Mayer's Reagent, $\frac{1}{2}$ strength, precipitates of Cocaine.
1 : 200	0.0062
1 : 300	0.0066
1 : 400	0.0070
1 : 500	0.0074
1 : 600	0.0078

Or, we may make the correction for excess of reagent as already explained. The following table may also be of service in interpreting results:

Quantity of Mayer's reagent, $\frac{1}{2}$ strength, required to precipitate a given quantity of cocaine.

Quantity of Cocaine.	Measure of Fluid titrated 5 cc.	Measure of Fluid titrated 10 cc.	Measure of Fluid titrated 15 cc.	Measure of Fluid titrated 20 cc.
.010	1.6			
.020	2.7	3.1		
.030		4.2	4.6	
.040		5.3	5.7	6.2
.050		6.4	6.8	7.3
.060			7.9	8.4
.070			9.0	9.5
.080				10.6
.090				11.7
.100				12.8

Results of any titration higher or lower than those included in the table, are beyond the limits of dilution or concentration admissible, and would call for repetition of the experiment. Instead of depending on titration, in case we have to deal with solutions of the alkaloid, we may collect the precipitate on a double filter, wash slightly in such a way as to wash the filters more than the precipitate, dry and weigh. The weight of the precipitate multiplied by 0.406 will give, quite closely, the weight of alkaloid present.—*Amer. Jour. Pharm.*, June 1886, 273-278.

Cocaine—Reactions.—Prof. Chas. O. Curtman has observed that cocaine possesses strong reducing action, which, while not as strong as that of morphine and other opium alkaloids, is much stronger than that of the cinchona and nux vomica alkaloids. To show the relative reducing power of different alkaloids, a freshly prepared solution of ferricyanide of potassium was mixed with an equivalent quantity of solution of ferric chloride, the mixture having been carefully protected from the light. Blotting paper was saturated with the mixture, then touched with solutions of the different alkaloids of the same strength, and exposed in a shady place. The places touched with *morphine* were blued in half a minute; with *cocaine*, in one and one-half minute; with *brucine*, in six minutes; with

quinine, in seven minutes; with *cinchonine*, in ten minutes; while no reaction was shown with either *strychnine* or *veratrine* after fifteen minutes.

Of other reactions for the identification of cocaine, the author considers the production of benzoic acid upon treatment with dilute acids and the precipitation with tannic acid, following only upon addition of an acid, to be quite characteristic.—*Pharm. Rundschau*, Nov. 1885, 252.

Cocaine Reaction with Permanganate of Potassium.—Dr. Giesel states that 1 centigram of hydrochlorate of cocaine dissolved in 2 drops of water is precipitated by a solution of permanganate of potassium (1:330), with formation of an insoluble violet double salt of the alkaloid, and recommends the reaction as a characteristic test.—*Pharm. Ztg.*, Feb. 27, 1886, 132.

Prof. Flückiger confirms the above observation of Dr. Giesel, and observes in addition that sometimes very fine microscopic crystals of the salt make their appearance. He regards the test very characteristic for cocaine. On the other hand, morphine, strychnine and quinine simply cause a reduction of the permanganate, no double salt being present.—*Pharm. Jour. and Trans.*, March 20, 1886, 800.

Cocaine Hydrochlorate—Tests of Purity.—Mr. Beckurts criticizes the tests which require that the hydrochlorate of cocaine should volatilize completely when heated on platinum foil, and dissolve clear and colorless in water and in concentrated sulphuric acid. He points out that although adherent extraneous impurities derived from the coca leaves would be indicated by coloration in contact with sulphuric acid, this would not be the case with decomposition products of the alkaloid itself. Moreover, the coloration would sometimes depend upon the relative properties of the salt dissolved in the acid.

Giesel's test, dependent on the formation of a violet-red precipitate, with solution of permanganate of potassium without the reduction of the permanganate (see above), he considers to be open to the same objection, since the permanganate is not reduced directly by the decomposition products of the alkaloid.

The author would, therefore, require in addition that the salt should be perfectly neutral, so that a small quantity placed on moistened blue litmus should give no indication of acidity. Also, that when heated with excess of permanganate no odor of oil of bitter almonds be given off. As additional tests for the identification of cocaine, the author recommends to heat a little of the alkaloid with alcoholic potash, when the characteristic odor of benzoic ether should be given off, or the addition of a little perchloride of iron to a solution of the alkaloid in sulphuric acid, which should give rise to a yellow turbidity that disappears on warming.—*Pharm. Jour. and Trans.*, May 1, 1886, 920; *Pharm. Centralh.*, March 25, 1886, 140.

Cocaine—Characters of Purity and the Permanganate Test.—Dr. A. B. Lyons finds the above test of Dr. Giesel applicable under certain precautions, and gives the characters which a pure hydrochlorate of cocaine should possess, as follows:

It should be nearly or quite odorless; especially it should not have an acid odor, or one resembling benzoic acid. The reaction should not be strongly acid to litmus. The salt should dissolve in sulphomolybdic acid without producing any transient brown coloration, or any immediate coloration whatever. It should dissolve also in sulphuric acid to a colorless solution. A 2-per-cent. solution of the salt should not become brown on addition of a drop or two of decinormal solution of potassium permanganate, neither should the solution develop any strong foreign odor on heating after the addition of a larger quantity of the permanganate. The precipitate produced in stronger solutions by permanganate must be of a clear, violet-purple or red color, and must consist, at least in part, of distinct rhombic crystals of cocaine permanganate.—*Amer. Jour. Pharm.*, May 1886, 240-241.

Cocaine—Methods of Sterilizing its Solutions.—The following methods for preparing stable solutions of cocaine by sterilizing them are communicated to "*Droguisten Zeitung*."

1. Weigh the hydrochlorate of cocaine upon a watch-glass, and place this, together with the requisite vials, filter, small glass-funnel, and all other implements which the solution will afterwards come in contact with, into a drying oven, where a temperature of 100° to 110° C. (212° - 230° F.) is maintained for several hours. The requisite water is also heated for a like period. The solution is then prepared, filtered while still as hot as possible, and the vials immediately stoppered with tight plugs of pure cotton.

2. In a graduated cylinder weigh the requisite amount of hot water, add the weighed cocaine salt, and after the volume has been marked, add as much more water as will evaporate in the drying oven or on the water-bath in a few hours (about half of the volume of the solution). Then heat on the water-bath until the excess is evaporated and the former level (or the original weight) has been reached. The solution, if clear, may be at once transferred to vials which are stoppered with plugs of cotton previously sterilized by heating at 100° - 110° C. Since hydrochlorate of cocaine requires a heat of 185° C. (365° F.) to melt, and does not even decompose then, there can be no harm in sterilizing its solutions at the above-named temperatures.—*Amer. Drugg.*, Feb. 1886, 29.

Cocaine—Remedial Value in Sea-sickness.—Dr. Manassein (St. Petersburg) reports that he went on a voyage on purpose to test the efficacy of cocaine in sea-sickness. Two individuals to whom he administered the hydrochlorate of cocaine on starting were for the first time in their lives

free from sea-sickness during a period of forty-eight hours of rough weather, and enjoyed a good appetite the whole time. A child, six years old, attacked early in the morning with sea-sickness, was able to play about during the storm after taking cocaine. In another case, in which a girl eighteen years of age had been sick for twenty-four hours before taking the cocaine, six doses proved effectual. The author thinks, therefore, that he is quite justified in inferring that in hydrochlorate of cocaine we have a certain and harmless remedy against sea-sickness.—Pharm. Jour. and Trans., Oct. 3, 1885, 386; from Berl. Klin. Woch., Aug. 3, 1885.

Cocaine—Novel Application of its Anæsthetic Power.—The anæsthetic power of cocaine has been applied in microscopy by Prof. J. Richard as a means of killing hydroids and bryozoa while their tentacles, etc., are still in a state of expansion. The animals are placed in a glass with 5 cc. of water, and when they are fully expanded, a $\frac{1}{2}$ per cent. solution of hydrochlorate of cocaine is added drop by drop till it forms a fifth part of the fluid. Half a cubic centimetre of the solution is then added, and in ten minutes the animals are dead, and can be mounted in the usual way.—Pharm. Jour. and Trans., Oct. 31, 1885, 368; Journ. Roy. Med. Soc., 1885, 893.

Cocaine—Value in Infantile Diarrhœa Caused by Teething.—It is stated in "Therap. Gaz." (1885, 789) that a 4 % solution of cocaine, rubbed on the gums at intervals of half an hour, is useful in checking the diarrhœa of infants due to irritation caused by teething.

Cocaine—Value in Whooping Cough.—Dr. Prior has used cocaine with a certain amount of success in the treatment of whooping cough. For this purpose a 15 or 20 per cent. solution is used to paint the fauces and upper part of the larynx, so as to produce complete anaesthesia in these parts. Inhalation of a 20 per cent. solution did not prove successful. According to Dr. Labrie, this treatment will reduce the fits of coughing from 15 or 20 to 5 or 6 during one day. A 3 per cent. solution used in a similar manner has been recommended by Dr. Graeffner for the treatment of nervous cough in hysterical women.—Phar. Jour. Trans., Nov. 28, 1885, 445.

Cocaine—Toxic Effects and Antidote.—Dr. Schilling records a case of poisoning by cocaine, injected into the gums of a woman aged 28, to facilitate the extraction of a tooth, six drops of a 20% solution having been injected. The patient became unconscious in spite of the administration of stimulants, but was restored after the inhalation of nitrite of amyl, a second and third inhalation of three drops of the ether being necessary.—Med. Chron., Feb. 1886, 397.

Cocaine—Disadvantages.—At a meeting of the Clinical Society of London several members present expressed the opinion that cocaine,

whether in solution or in the form of gelatin discs, has a tendency to cause panophthalmitis. It was also stated that Gräfe had found chronic interstitial keratitis much more common since he had used cocaine. Mr. H. M. McHardy, who had experienced similar results from the use of cocaine, remarked that fifteen days appeared to be the longest time that it was safe to keep a solution of the alkaloid, and that since he uses a freshly prepared 8 per cent. solution he had had no bad cases. Gelatin discs are objectionable on account of their hygroscopicity. Dr. Ziem reports a case in which two drops of a 4 per cent. solution applied to the eye of a man caused symptoms of syncope, and states that seventeen cases are recorded in ophthalmological literature in which toxic effects have followed the use of cocaine. Dr. Hall describes a case in which cocaine spray applied to the posterior nares caused laryngeal spasms.—Pharm. Jour. and Trans., Nov. 28, 1885, 445; Brit. Med. Jour., Nov. 21, 1885, 971.

Cocaine Benzoate—Superiority over the Hydrochlorate.—Mr. Bignon states that the benzoate of cocaine is preferable to the hydrochlorate; the anæsthesia produced by the benzoate is more durable, and when applied to wounds it is painless. One gm. of the crystallized benzoic acid is saturated by 3 gm. of cocaine. A solution of 1:20 can be prepared by saturation when wanted.—Bulletin Commercial, Feb., 1886, 88; Amer. Jour. Pharm., May 1886, 247.

Benzoate of Cocaine—Proper Characters, etc.—The recommendation of benzoate of cocaine as being likely to possess more pronounced anæsthetic properties than any other salt of cocaine has created some demand for this article. Dr. B. H. Paul draws attention to the circumstance that an article has been supplied by a reputable French manufacturer, under the designation of cocaine benzoate, which is in the form of a light crystalline powder, not very readily soluble in cold water, but dissolving at once, on application of a gentle heat, in about thirty parts of water, and on evaporation of this solution yielding a mass of delicate acicular crystals. The author, failing to obtain a compound corresponding in its character to this French specimen, was led to make some experiments, which elicited that benzoate of cocaine is readily produced by mixing benzoic acid and cocaine in suitable proportions with only a drop or two of water, a thick liquid being formed which, when exposed over oil of vitriol for a few days, dried to a gummy mass and eventually assumed a crystalline structure. By suitable manipulation acicular crystals could be obtained, but these were quite different from those supplied from France. The salt so produced is characterized by extreme solubility, and gives with ammonia and hydrochloric acid the characteristic reactions of cocaine and benzoic acid salts. The French salt, on the other hand, gives no precipitate with ammonia nor with hydrochloric acid, and in the light

of the author's experiments must be regarded as a product of change resulting from some unobserved action that had taken place during the process of manufacture. The author regards it to be *benzoyl-ecgonine*, but is engaged in further experiments to determine this definitely.—Phar. Jour. and Trans., March 27, 1886, 817.

Benzol-ecgonine—A New Alkaloid from Coca.—Prof. Skraup has had opportunity to examine a new alkaloid prepared in Mr. Merck's laboratory from coca leaves. It has the constitution of benzol-ecgonine and is convertible into cocaine.—Pharm. Post, July 18, 1885, 792; Pharm. Jour. and Trans., Aug. 1885, 105.

Benzol-ecgonine—Physiological Action.—Dr. Ralph Stockman, at the request of Mr. E. M. Holmes, has made an examination of the physiological action of benzol-ecgonine. The results of his experiments, which are given at length in the author's paper, make it evident that benzol-ecgonine is practically identical with caffeine in its action, although there are some minor points of difference. The chief action of cocaine, namely paralysis of the sensory nerves, is quite absent.—Pharm. Jour. and Trans., April 24, 1886, 897–898.

Caffeine—Percentage Present in the Leaves of Ilex Cassine, which see under "Materia Medica."

Caffeine—Preparation of Hypodermic Solution.—Owing to the sparing solubility of caffeine, pharmacists are sometimes perplexed when making a solution for hypodermic use. Mr. Tanret recommends the following:

R. Sodii benzoatis.	2.95
Caffeini.	2.50
Aquæ dest.	10 cc.

Mix the benzoate of sodium and caffeine in a mortar and add the water; filter. Benzoate of sodium is preferable to the salicylate. If any trace of iron is present, salicylate of sodium would form a rose-colored solution.—Amer. Jour. Pharm., May 1886, 247; from Répertoire de Pharmacie, March 1886, 119.

Caffeine—Poisonous Dose and Treatment.—Dr. E. N. Liel reports a case of poisoning from eighteen grains of citrate of caffeine, which was relieved by hypodermic injections of atropine and drachm doses of whisky.—Amer. Jour. Pharm., Feb., 1886, 104; from N. Y. Med. Jour.

Double Caffeine Salts—Preparation of Several.—Mr. C. Schwarz gives directions for preparing

Sodio-Benzoate of Caffeine, recommended on account of its great solubility for hypodermic use as follows: Dissolve 21.2 parts of caffeine and 12.2 parts of benzoic acid (artificial, made from toluol) in 300 parts of water, with the aid of heat, and add 16.2 parts [the author has 14.4 parts but the salt contains one molecule of water] of benzoate of sodium.

Filter and evaporate the filtrate in a porcelain capsule on the water-bath. Rub the residue to powder and dry it once more.

Sodio-Cinnamate of Caffeine is prepared in the same manner, using the following ingredients:

Caffeine.	21.2 parts.
Cinnamic acid	14.8 parts.
Cinnamate of sodium	17.0 parts.

Sodio-Salicylate of Caffeine is prepared like both the above forms:

Caffeine.	21.2 parts.
Salicylic acid	13.8 parts.
Salicylate of sodium	33.8 parts.

—Amer. Drugg., Oct. 1885, 195; Pharm. Ztg., 1885.

Caffeino-Natrium Benzoicum—*Characters*.—The Pharmacopœia Commission of the German Apothecaries' Association defines the character of benzoate of caffeine and sodium. The following abstract is of interest: White granules composed of an amorphous powder, having a faint odor of benzoin, and an aromatic, bitter, benzoin-like taste. When carefully heated between two watch-glasses a sublimate of caffeine is obtained. It is soluble in 2 parts of water by the aid of heat, but requires 40 parts of alcohol for solution, and, when treated with chloroform, yields its caffeine to the solvent, the amount so dissolved amounting to 40 per cent. of the compound. The maximum daily dose is 1.5 gram; the single dose not more than 0.5 gram. The same Commission gives a definition of

Caffeino-Natrium Salicylicum, (Salicylate of caffeine and sodium), from which the following may find place here: It constitutes a white, amorphous powder, odorless, and having a peculiar bitter-sweet taste. As in the case of the above compound, the caffeine may be sublimed at a temp. of 180° C. It is soluble in 2 p. water, 20 p. alcohol, and yields caffeine, amounting to 50 per cent. of its weight, to chloroform. The maximum single dose is 0.4, daily dose 1.2 grams.—Arch. Pharm., July 2, 1885, 544-545.

Nitro-Salicylate of Caffeine—*A New Heart-Tonic*.—Prof. Wagner recently employed the new heart-tonic, the nitro-salicylate of caffeine, in his clinic in Buda-Pesth, on twelve patients (Oroosi Hetilap., No. 32, 1885). The daily dose varied from 3 to 18 grains. The results were the same as those observed by Riegel. The remedy is a rival of digitalis, but has the great advantage of being more rapid, and never accumulative in its effect. The only drawback seems to be, that with the discontinuance of the remedy its effect also quickly ceases. At the beginning, but small doses should be administered, as many patients evince a peculiar idiosyncrasy against the drug.—Med. and Surg. Rep., Jan. 30, 1886.

Ethoxycaffeine—*A New Compound*.—Mr. Dujardin-Beaumetz de-

scribes this compound, in which an atom of oxygen in the caffeine molecule has been replaced by the ethoxyl group, OC_2H_5 , as occurring in white crystalline needles, melting at 140°C ., slightly soluble in alcohol and in ether, and insoluble in water. It is strongly basic. The author states that the introduction of ethoxyl groups into the atomic constituents of caffeine appears to modify the physiological and therapeutic properties of that alkaloid, and give to it a marked sedative action upon the cerebro-spinal system, as well as incontestible narcotic properties. In doses of 25 centigrams it has been found efficient in the treatment of headache, and in doses of 50 centigrams it induced sleep. Its insolubility is a drawback, but it is proved to be soluble in a solution containing an equal quantity of salicylate of sodium.—Pharm. Jour. and Trans., May 1, 1886, 919; L'Union Pharm., April 1886, 189.

Guaranine—Preparation.—Messrs. Bochefontaine and Gusset give the following formula for making guaranine: 5 gm. of powdered guarana are mixed with 1 gm. of calcined magnesia and the whole moistened with water; after twenty-four hours the mass is exhausted with 40 gm. of boiling chloroform, the chloroform distilled or evaporated, and the residue treated with boiling water, filtered and evaporated over sulphuric acid. After several recrystallizations, colorless crystals of guaranin are obtained. Yield=4.5 per cent.—Amer. Jour. Phar., May 1886, 248; from Chem.—Techn. Central Anzeiger, iv. 322.

Colchicine—Determination of Its Non-Crystallinity.—The statement of Hondés that he had obtained colchicine in crystalline form (see Proceedings 1885, 319) has induced Mr. C. J. Bender to attempt the preparation of the same, following the directions of Mr. Hondés explicitly. Mr. Bender extracted 48½ kilos of colchicum seed, first with 600 litres, and then again with 300 litres of hot alcohol of 95 per cent. The liquid having been cleared by settling and filtering, the alcohol was distilled off at a gentle heat. The residue was then made up with water to 30 litres, and the liquid deprived of fat by repeated shaking with petroleum-ether. The aqueous solution, after being separated from the ethereal solution of fat, was slightly warmed to remove traces of the petroleum ether, and filtered after cooling. The yellowish-brown filtrate was then shaken with 25 kilos of chloroform (free from alcohol) during two hours, and set aside for some time to settle. When the liquids had become sharply separated, the chloroform solution of colchicine was removed, treated with bicarbonate of sodium, and as much of the chloroform distilled off at a gentle heat as possible. The residue, dried to a constant weight, amounted to 276 gm., or to 0.569 per cent of the original colchicum (taken as air-dry). After addition of soda to the liquid treated with chloroform, and repeated agitation with fresh portions of the latter, 20 gm. more of a dark-colored alkaloid having the nauseous odor of hyos-

cyamine were obtained, which was not further studied. The crude colchicine obtained was dissolved in 250 grams of alcohol at a gentle heat. The solution was allowed to cool, and the loss by evaporation restored. It was then mixed with 250 gm. each of chloroform and benzin, and set aside for several days in a lukewarm place to evaporate spontaneously. At no time was there a sign of crystals observable, even when the bulk had diminished to 250 gm. Subsequent renewed treatment with tartaric acid and warm water, and removal of resinous matter, led to no better result. The colchicine is finally obtained as a pale yellowish, amorphous powder, amounting to 0.4948 per cent. of the original weight of the seeds. It was impossible to obtain an absolutely colorless preparation, since traces of colchicoresin accompany it, which has an enormous coloring power, and is not entirely insoluble in water. The author is therefore forced to the conclusion that Hondés' crystalline colchicine is a myth. True colchicine is always obtained as an amorphous powder, melting at 145° C., and is neutral. It cannot combine with acids, and even its tannate is an indefinite compound. Bender's colchicine was found to be absolutely identical with that obtained and studied by Hertell and Dragendorff.—*Amer. Drugg.*, Sept. 1885, 162; *Pharm. Centralh.*, June 25, 1885.

Alkaloids of Jaborandi.—A summary of what is at present known concerning the alkaloids of jaborandi is given in *Pharm. Ztg.* (July 15, 1885). It was early suspected, on physiological grounds, that in addition to "pilocarpine" jaborandi contained a second alkaloid, and this being demonstrated chemically, the second alkaloid was named "*jaborine*." Prof. Schmiedeberg examined jaborine and found it to agree exactly with an unnamed base that occurs in the fly fungus along with muscarine. Mr. Merck now announces the discovery of two other alkaloids, which have been named "*pilocarpidine*" and "*jaboridine*," the former behaving like pilocarpine and the latter like jaborine, the two alkaloids not pre-existing in the drug but being oxidation products of the two last named alkaloids. Jaboridine is syrupy; its nitrate forms beautiful prisms. Pilocarpidine corresponds chemically in most respects with pilocarpine, but differs in that the aqueous solutions of its salts are precipitated by chloride of gold.—*Pharm. Jour. and Trans.*, Aug. 1, 1885, 106.

Pilocarpine—Value as an Antidote to Poisoning by Thorn-apple Seeds.—See *Datura*, under "Materia Medica."

Emetine—Methods of Preparation and Assay in Ipecac, which see under "Materia Medica."

Sulphate of Beberine, B. P.—*Complex Composition*.—Mr. D. B. Dott observes that the examination of this salt is beset with difficulties on account of the refusal of the alkaloids or their salts to crystallize in their

crude state. As the result of a series of experiments, the author is clearly of opinion that there are certainly two, probably three, and possibly a greater number of alkaloids in the Pharmacopœial sulphate. The total alkaloids amount to about 6.5 per cent. of the salt, and of that quantity beberine constitutes something like a half. The beberine is soluble in ether and in benzin, in which menstrua the other alkaloids are insoluble, or nearly so. The reason of the precipitate, obtained on applying the official test, being entirely dissolved by the ether, is that the other alkaloids are held in solution by the caustic alkali and salts. The different alkaloids are evidently closely related, as the portions of precipitate separated by ether, chloroform, and alcohol, all give precipitates with dilute nitric acid, and have other characters in common. They are very probably derivatives of one and the same base.—Yearbook of Phar., 1885, 420-422.

Sparteine—Improved Process of Preparation.—Messrs. Hondé and Laborde communicate an improved process for the preparation of sparteine from *Spartium Scoparium*, which consists in exhausting the leaves and branches of the plant, reduced to a coarse powder, with 60 per cent. alcohol, filtering, distilling off the alcohol in a partial vacuum, dissolving the residue in solution of tartaric acid, filtering to remove greenish gelatinous matter—consisting principally of chlorophyll and scoparin—making the acid solution slightly alkaline with carbonate of potassium, and then shaking several times with five or six times its volume of ether, which removes all the alkaloid. This is purified by repeating the treatment with acid, alkali, and ether several times, about 3 grams being obtained in this way from a kilogram of the drug. Sparteine is described as a colorless liquid, heavier than water, containing no oxygen, and boiling at 278° C. Its odor is rather pungent, recalling that of pyridine; its taste is very bitter. It thickens and becomes brown on exposure to air. It is soluble in alcohol, ether, and chloroform, and is insoluble in benzin and in petroleum oils. It is a strong base, and readily combines with acids to form crystallizable salts. The

Sulphate of Sparteine forms large, transparent, rhombohedral crystals, which are very soluble.—Pharm. Jour. and Trans., Dec. 1885, 543; Rép. de Pharm., Dec. 1885, 533.

Sparteine Sulphate—A New Remedy in Heart Affections.—The alkaloid *sparteine*, which is obtained from *Spartium Scoparium*, is an oily liquid, decidedly alkaline, insoluble in water. Sparteine forms with sulphuric acid a crystallizable salt, soluble in water. Germain-Sée experimented with an aqueous solution of sulphate of sparteine—10 centigram doses produce a remarkable effect on the heart without disturbing digestion or influencing the nervous system. Germain-Sée employed it in a number of cases, and cites as the result of his experiments in cardiac affections,

three characteristic effects. The first, which is the most important, is the quickening and renewed action of the heart and pulse, in this respect resembling digitalis or lily of the valley, but its action is more prompt and more durable. The second is the regulation of the disturbed heart rhythm; no other medicine can be compared with it for this purpose. The third is the acceleration of the heart beat. All these effects appear in about one hour or several hours at the most, and are maintained three or four days after the medicament has been taken. During this time the general strength is increased and respiration is quite easy. When the pulse is irregular, intermittent and arrhythmic, sulphate of sparteine quickly re-establishes the normal type. When the circulation is slower the medicament appears to immediately obviate the functional trouble, maintaining and augmenting the acquired force of the heart muscle.—*Amer. Jour. Pharm.*, Feb. 1886, 103; from *Bulletin Général de Thérapeutique*, December 1885, p. 528.

Piperidine—Complete Synthesis.—Prof. Ladenburg has succeeded in bridging the only gap that remained in the way of effecting the complete synthesis of piperidine. This consisted in the preparation of the hitherto only theoretically known compound

Pentamethyldiamine, which he accomplished by reducing trimethylene-cyanide by treatment of a hot solution in absolute alcohol with sodium. Pentamethyldiamine ($C_5H_{14}N_2$), when isolated, is a colorless, syrupy liquid, having a very decided piperidine odor, easily dissolved by water and by alcohol, less readily by ether, boiling between 175° and 178° C., and having a sp. gr. at 4° C. of 0.9174. When heated, ammonia is evolved, leaving the elements of piperidine, and in order to prevent the decomposition from going too far, the author takes advantage of the observation that hydrochlorate of piperidine distills undecomposed, converting the pentamethyldiamine into hydrochlorate before heating it. The piperidine was separated by treating the distillate received in water with strong potash solution, shaking repeatedly with small quantities of ether, and removing the base from the ether as hydrochlorate. Upon examination, it proved to be perfectly identical with natural piperidine. The secondary decomposition seems to take place to some extent even in the first operation, since there is a slight formation of piperidine, together with the pentamethyldiamine, following the reduction of the trimethylene-cyanide. Prof. Ladenburg classes piperidine as

Pentamethylimine—“imines” being the name by which he designates a class of compounds derived from diamines by the loss of ammonia, similarly to the formation of “imides” from diamides.—*Pharm. Jour. and Trans.*, Dec. 26, 1885, 544; *Ber. d. D. Chem. Ges.*, xviii, 2956 and 3101.

Hydrochlorate of Percirine—Use in Intermittent Fever.—Dr. Clemente

Ferreira, of Brazil, reports a number of cases of intermittent fever treated successfully with hydrochlorate of pereirine after quinine and arsenic had been tried in vain. He administers thirty grains, divided into four doses, beginning four hours before the expected chill, half an hour being allowed to intervene between the doses. This effectually prevents the paroxysm, which, however, may return on the following day. On the third day, the medication is repeated as before, and after that the fever does not reappear. The value of pereirine, according to the writer, is equally great in the treatment of irregular paludic manifestations.—N. Y. Med. Jour., May 8, 1886; Amer. Jour. Pharm., June, 1886, 278; Bull. Gén. de Thérap., April 15, 1886.

Hydrochlorate of Pelletierine.—*New Medicinal Use*.—Dr. Galezowski has used the hydrochlorate of pelletierine successfully in the treatment of paralysis of the muscles of the eyes supplied by the third and sixth pair of nerves. It was administered in the form of syrup—1 grain in 120—four tablespoonfuls being taken daily.—Pharm. Jour. and Trans., May 29, 1886, 1006; Med. Chron. Mag., 1886, 170.

Wrightine.—An alkaloid from the seeds *Holarrhena* (*Wrightia*) *antidysenterica*, which see under “Materia Medica.”

Calamine.—A new alkaloid from *Acorus Calamus*, which see under “Materia Medica.”

Cascarilline.—*Amorphous Modification*.—See *Cascarilla bark*, under “Materia Medica.”

Piliganine.—A new alkaloid from *Lycopodium Saussurus*, which see under “Materia Medica.”

Anagryne.—*A New Alkaloid*.—Messrs. Hardy and Gallois have extracted an alkaloid from *Anagryis fatida* and *A. indica*. According to the former, small doses act as a tonic, but large doses cause the death of small animals by arresting respiration.—Amer. Drugg., Aug. 1885, 160.

Tulipine.—*Physiological Action*.—The alkaloid is extracted from the garden tulip when fully developed; it occurs, probably, in every part of the plant, even in the brilliantly colored petals. It was discovered some little time back by Gerard, and next alluded to by Ringer in the *Edinburgh Medical Journal*. It acts as a powerful sialagogue, producing a considerable flow of saliva without exerting any action on the pupil of the eye. Frogs poisoned by tulipine died with the heart in systole and with the same symptoms as those exhibited by animals poisoned with veratrine. Very little, however, is yet known about this new alkaloid, either chemically or therapeutically; it is supposed to be a muscular poison which acts upon the medulla and the nerves of sensation. Unlike many other alkaloids, it appears to have no action whatever on the pupils. It is not improbable that it will be found related to colchicine and scilli-

tine, derived from plants of a similar nature.—*Amer. Drugg.*, Nov. 1885, 218.

Danaidine—Non-Existence.—See *Danais fragrans*, under “*Materia Medica.*”

Parthenine—Complex Constitution.—See *Parthenium Hysterophorus*, under “*Materia Medica.*”

Parthenine—Value in Facial Neuralgia.—The alkaloidal substance, parthenine, from *Parthenium Hysterophorus*, an herb growing in Jamaica, has been used successfully by Tovar in the treatment of facial neuralgia. One-tenth of a grain was given hourly, and then the dose was decreased in size and frequency. In Jamaica, the drug is used in skin diseases.

The Cuban plant known as “bitter broom” (*escoba amarga*) is said by Dr. Antonio L. Esporon, of Havana, to be a source of this alkaloid. He reports two cases of neuralgia treated successfully with this remedy, and says he has employed it in many cases of facial neuralgia with great success, and believes that it is especially indicated in neuralgias of malarial origin.—*Amer. Drugg.*, Aug. 1885, 147.

Harmaline—Characters, etc., as Obtained from Perganum Harmala, Lin., which see under “*Materia Medica.*”

Lantanine—A New Alkaloid from Lantana brasiliensis.—Dr. Negrete has discovered an alkaloid in *Lantana brasiliensis*, which, like the plant, appears to possess valuable antipyretic properties. It, like quinine, depresses the circulation and lowers the temperature, but is tolerated by the most delicate stomach. Intermittent fevers which have not yielded to treatment with quinine have given way under the use of 2 grams of lantanine. The dose hitherto given has been one or two grams during the twenty-four hours, prescribed in the form of pills containing 10 centigrams each, and given immediately after the commencement of the hot stage. In ninety-five cases out of one hundred the return of the hot stage was prevented. Dr. E. Buiza had hitherto used the plant as an antipyretic in the Central Hospital of Lima.—*Phar. Jour. and Trans.*, Oct. 3, 1885, 289; from *Nouv. Rem.*, Sept. 15, 1885, 282.

Stillingine—An Alkaloidal Substance from the Root of Stillingia Sylvatica, which see under “*Materia Medica.*”

Trigonelline—A New Alkaloid from the Seed of Trigonella Fœnum-Græcum, which see under “*Materia Medica.*”

Baptitoxine—A Poisonous Alkaloid from Baptisia tinctoria, which see under “*Materia Medica.*”

A Poisonous Alkaloid has been determined in old *Flour*, which see under “*Materia Medica.*”

Choline.—Occurrence of a Closely Allied Body in Cascarilla Bark;

also in the seeds of *Trigonella Foeniculum-Gracum*, which see under "Materia Medica."

Coniine.—*Synthetical Experiments*.—Professor Ladenburg has made an attempt to produce coniine synthetically, and has so far succeeded as to obtain a base very nearly allied to, and probably chemically identical with the natural alkaloid. The author caused paraldehyd to react upon *a*-picoline at a temperature of 250° C., and obtained a small quantity of an oily fluid that was with difficulty soluble in water and smelt like conyrene, but had the composition of allylpyridine. By subjecting this to a process of reduction, a base was obtained which was converted into hydrochlorate, and this into a double salt of cadmium and iodine, which, after recrystallization, was obtained in well formed crystals, resembling those of the natural coniine salt, and fairly corresponding to it in the figures obtained by analyses. From this salt a base was regenerated that resembled natural coniine exactly in odor, solubility in water, boiling point, character of nitroso compounds, etc., but the hydrochlorate of the base had a somewhat lower melting point. The author will continue his work upon larger quantities, assuring also the perfect purity of *a*-picoline.—Ber. d. D. Chem. Ges. xix., 439.

Nicotine.—*Percentage Occurring in the Persian Tobacco known by the name of Tumbeki*, which see under "Materia Medica."

Ptomaines.—*Possible Production During the Process of their Extraction*.—In a former paper on the ptomaines, Mr. F. Coppola had pointed out the probability that their genesis is due to the process, such as Dragenдорff's, used for their extraction; a description is given of experiments on the putrefaction of large quantities of various tissues and organs, such as muscle, pancreas, spleen, brain of dog, etc., kept from free access of air, and at the ordinary temperature. For a fortnight the putrefying mass had an acid, but at the end of six weeks a decidedly alkaline reaction. Both the liquid and the solid portions of the resultant mass were extracted with benzene. The extract, on evaporation, gave an abundant yellow residue, which showed all the characteristic reactions of alkaloids. From this result it is inferred that the process of putrefaction is not capable of producing ptomaines, but that the acid reaction conduces to the decomposition of lecithins, with generation of a substance having the properties of an alkaloid.

The relatively small quantity obtained from more than 2 kilos. of putrefying material seems further to indicate that the alkaloids extracted by the Dragenдорff and Stas-Otto methods are mainly formed by the processes employed for their extraction.—Jour. Chem. Soc., 1885, p. 913; from Gazz. Chim. Ital., xiv, 571-572.

Aniline Oil.—*Anæsthetic Action*.—Dr. Govan has used aniline oil successfully as an anæsthetic. Even cutting down to the bone caused no

pain when the finger operated on had been dipped in the oil.—Brit. Med. Jour., March 20, 1886, 564.

Sulphate of Fuchsine.—*Harmless Character*.—Messrs. Cazenueve and R. Lépine have made a series of experiments to determine the effect upon man of certain coloring matters, employed for the artificial coloring of wines. It has been administered by them in doses of 2 to 4 grams per day without producing an appreciable deleterious effect, and the authors even go so far as to say that they consider it absolutely devoid of toxic properties, and without either physiological or therapeutic interest.

Safranin, also said to be employed to color wines, was found to be decidedly poisonous when injected into the veins of a dog. When administered by the mouth in doses of 1 to 4 grams per week, it only produced diarrhoea and salivation. On the other hand, the red coloring matter for wines, known in French commerce under the name of

Rouge Soluble, has been found by the authors to be like the "*Sulpho de fuchsine*" absolutely free from any poisonous properties.—Pharm. Jour. and Trans., Nov. 28, 1885, 446; Compt. Rend, ci, 823 and 1011.

Sulphanilic Acid.—*Use as a Remedy in Iodism*.—Dr. Ehrlich uses sulphanilic acid as a remedy for iodism. Where it is desirable to give iodine for some time, and the patient shows an inclination to iodism, he gives it in doses of 3 or 4 grams; as soon as the patient shows symptoms of iodism he gives 6 or 7 grams at once. Sulphanilic acid is best dispensed in aqueous mixtures with bicarbonate of sodium, using 2 parts of the alkali with 3 parts of the acid.—Phar. Rundschau, xii, 167.

Leucoamines.—*Discovery of Two New Basic Animal Substances*.—Mr. Armand Gautier draws attention to the discovery of two new animal alkaloids. One of these,

Adenine, occurs both in the pancreas and the spleen, and is remarkable for being polymeric with hydrocyanic acid, its formula being $C_5H_5N_5$, or exactly that of five molecules of prussic acid. If it is treated with caustic potash a considerable quantity of cyanide of potassium is formed. Treated with nitric acid it is converted into hypoxanthine or sarcine. The second leucoamine was discovered by Mr. Morell in the spleen. It is said to possess properties resembling those of muscarine and digitalin.—Pharm. Jour. and Trans., May 1, 1886, 921.

Diphenylamine.—*A Delicate Reagent for Nitrogen Acids and Free Chlorine*.—Dr. H. Hager recommends two solutions as being convenient for use: 1, one gram of diphenylamine in 30 cc. of absolute alcohol, and 2, a mixture of 1 volume of this solution with 5 or 6 volumes of pure sulphuric acid, as diphenylamine sulphate. Both solutions are yellowish, and the latter becomes blue in the presence of nitrogen acids and other oxidizing agents.

For the detection of chlorine, place 3 or 4 cc. of the suspected liquid in a test-tube of 1 cm. width and pour 1 to 1.5 cc. of sulphate of diphenylamine carefully down the side of the tube, so as to let it collect on the bottom. According to the quantity of chlorine present, a blue coloration will be observed between the layers of the two liquids, or the whole of the lower liquid will be colored blue. Very slight traces may be detected if to 3 or 4 cc. of liquid 1 to 5 cc. of diphenylamine sulphate be added with the care stated above, so as to have two layers. Place the tube upon a sheet of white paper and shake well; a transient blue coloration, rapidly vanishing, will be observed; somewhat larger traces of chlorine show the blue color for a longer time.—Ph. Centrallhalle, 1885, 277-279.

Kairine, Thalline, Hydrochinone, Resorcin and Antipyrine—*Influence on the Heart and Blood Vessels*.—Dr. H. G. Beyer has made experimental inquiry into the probable relations of the artificial antipyretics to the circulating apparatus, and has arrived at the following results:

Kairine.—The author's experiments show that kairine reduces temperature, both by diminishing heat production and by increasing heat radiation. The distinctive influence it exerts on the red blood-corpuscles, however, and the weakening effect upon the heart, render its employment objectionable and dangerous.

Thalline.—Thalline, like kairine, reduces temperature by diminishing heat production, and by increasing heat radiation. As an antipyretic it is less dangerous, but no less objectionable, than kairine, for while its effect upon the ventricle of the heart is less depressing than that of kairine, its influence upon the blood-corpuscles is sufficient to condemn it.

Hydrochinone.—The action of hydrochinone is similar to that of kairine and thalline.

Resorcin.—Resorcin reduces the temperature by increasing heat radiation by the dilatation it produces in the capillaries and veins, especially the latter.

Antipyrine.—Antipyrine reduces temperature purely by increasing heat radiation, owing to its extensively dilating the veins and capillaries; but what stamps it as an excellent antipyretic is that, besides dilating the veins, it also has a tonic influence on the heart and slightly increases arterial pressure, or, at any rate, does not cause a diminution of the same. It has, moreover, no injurious influence on the blood or the muscular tissues, and strengthens the auricles.

The objection to the employment of kairine and thalline as antipyretics arises from the fact that they cause heart paralysis, especially affecting the auricles, in doses only slightly larger than are sufficient to produce a lowering of the temperature. But this objection becomes an absolute danger when we take into account the destructive influence upon the blood-corpuscles and tissues generally.

Hydrochinone and resorcin, although not exerting the same weakening and directly paralyzing influence upon the ventricle of the heart which is peculiar to kairine and thalline, both paralyze the venous side of the heart, viz., the auricles, and greatly lower the tone of the walls of the veins. The extra amount of blood, therefore, which is driven into the veins through the increased action of the ventricle, is only with great difficulty returned to the ventricle, and here the danger is not so much from failure in the power of the ventricle as in the case of kairine and thalline, as from the danger of *bleeding the animal to death into its own veins*. The intense visceral and especially pulmonary congestion found post-mortem, by Dujardin-Beaumetz and others, in animals killed by resorcin, seems to confirm this view of the matter.

Antipyrine, though largely dilating the veins, increases the power of contraction of both auricles and ventricle, and has no injurious influence upon the blood nor the muscular tissues, and therefore possesses, indeed, all the good qualities of a perfect antipyretic—*Amer. Jour. Med. Sciences*, April, 1886, p. 369-402; *Amer. Jour. Phar.*, April 1886, 196-197.

Phenolphthalein—Failure as an Indicator for Certain Substances.—Mr. E. Léger has observed that certain organic alkaloids have no action on phenolphthalein; thus the presence of morphine, quinine, etc., does not interfere with the titration of sulphuric acid; the same holds true with regard to hydrochloric and nitric acids. Cicutine and codeine are organic bases which affect this indicator. The author details experiments and concludes that—(1) It is possible to estimate an acid volumetrically as easily when combined with certain alkaloids as when in the free state. (2) This estimation may serve within certain limits to indicate the purity of a salt of the alkaloid.—*Jour. Chem. Soc.*, 1885, 931, from *Jour. de Phar.*, (5) xi. 425-428.

Phenolphthalein—Action of Atropine. See page 611.

Thymolphthalein—Preparation and Characters.—Mr. M. C. Traut obtains thymolphthalein as follows: Equal parts of thymol, phthalic acid and chloride of zinc are treated in a flask at a temperature not exceeding 150° C, until the melted mass, which under the proper conditions of temperature has a handsome red color, flows quietly. The mass is washed first with very dilute hydrochloric acid, then with water, and finally with petroleum ether to remove unchanged thymol, and the residual thymolphthalein is finally purified by repeated treatment with ether and recrystallization from ether-alcohol. The new substance is thus obtained in colorless, prismatic needles, easily dissolved by alcohol, but less readily by benzol, ether and chloroform, and quite sparingly by water. It melts at 252-254° C. Its most characteristic reaction is that its alcoholic or aqueous solution develops an intense blue color on addition of a minute quantity of alkali, which appears reddish by transmitted daylight, but

decidedly red by transmitted artificial light. The new phthalein may serve as indicator, since the blue color disappears upon addition of an acid. The author describes a number of compounds of the new substance, viz.: *Thymolphthalein-ethylate*, *Thymolphthalein-acetate*, *Thymolphthalein-benzoate*, and *Dinitrothymolphthalein*.—Arch. d. Pharm., July 2, 1885, 536–540.

Helianthin—Use as an Indicator.—According to Mr. H. le Chatelier, helianthin—the ammonium salt of dimethylaniline-azobenzol of sulphonic acid—promises to become a valuable indicator in analytical operations. The author points out that this reagent is not affected at all by hydrosulphuric acid, monosodium phosphate (NaH_2PO_4) and other substances capable of precipitating certain metals, which may be in combination with strong acids; and that the latter may then be determined volumetrically, which will in most cases also suffice for estimating the amount of base. For instance, zinc acetate may be decomposed by hydrosulphuric acid, and the liberated acetic acid determined by titration with standard alkali in presence of helianthin as indicator. The amount of acetic acid will at the same time furnish the quantity of zinc by a simple calculation. Aluminum salts may be similarly determined by precipitation with monosodium-phosphate.—Comptes Rend., c. 737.

Helianthin, it appears, was proposed by Prof. G. Lunge already in 1878 as a most delicate indicator in alkalimetry. He now draws attention to this fact, and that he had proposed to call it *methyl orange* instead of “Poirrier’s orangé iii,” the name by which it was at that time found in the markets. He says that whatever objections have been made against this substance as indicator are all due to the circumstance that too much of it has been used for coloring, or that the liquid to be titrated was heated, or that some other but the above-named chemical has been supplied under this name.—Ber. d. D. Chem. Ges., xviii., 3290.

Antipyrin.—Crystalline Form.—At the recent meeting of German naturalists and physicians, held at Strassburg, Prof. Flückiger exhibited some handsome crystals of antipyrin, which he had obtained from its aqueous solution. These were carefully measured by Liweh, who found them to belong to the monosymmetric system. Prof. Flückiger remarked that crystallized antipyrin would long ago have appeared on the market if its manufacture were not protected by a patent. At present it is only sold as an indistinctly crystalline powder, which, up to a short time ago, was not always pure and of uniform therapeutic effect.—Amer. Drugg., Nov. 1885, 213, from Chemiker Zeit.

Antipyrin.—Incompatibility with Spirit of Nitrous Ether.—According to Mr. Eules, sweet spirit of nitre and antipyrin, are incompatible, owing to the formation of an aniline.—Amer. Jour. Pharm., April, 1886, 165; from Pharmaceutische Rundschau, xxii. p. 70.

Antipyrin.—*Reaction with Spir. Æth. Nitrosi*.—Mr. James Kennedy, on mixing an aqueous solution of antipyrin with spir. aeth. nitrosi, observed that the solution, at first colorless, gradually assumed a deep green color, and subsequently deposited emerald-green crystals. He found that this compound was due to the union of the nitrous radicle with the antipyrin. The new compound is an acid, crystallizing in minute tabular crystals, sparingly soluble in cold water, easily by boiling water, by ether, alcohol and benzol, but insoluble in chloroform.—Pharm. Rec., Dec. 15, 1885, 415.

Antipyrin—Hypodermic Use in Sunstroke.—Dr. B. T. Westbrook has tried antipyrin as a remedy in sunstroke successfully. The dose given was 20 to 30 grains in hypodermic injection, a 50 per cent. solution being used. When made of this strength it produced little irritation.—Med. Times, Sept. 19, 1885, 310; Pharm. Jour. and Trans., Oct. 3, 1885, 288.

Antipyrin—Physiological Action and Uses.—Antipyrin, according to Dr. Neumann (Berl. Klin. Woch.) resembles salicylate of sodium in its action, and is recommended by him for further trial in chronic rheumatism of the joints and in rheumatic neuralgia. Dr. A. Walker (Brit. Med. Jour., Nov. 6, 1885), has observed it, in two cases of typhoid fever, to produce reduction of temperature to about normal, and good refreshing sleep for 5 or 6 hours; 15 grains of the remedy were given at 9 p. m., and 7½ grains each at 10 and 11 p. m. Antipyrin was also found useful to produce sleep in several cases of pyrexia in young children. Teaspoonful doses three times a day of the following mixture have been used by Dr. Dumolard in typhoid fever; antipyrin 20, Jamaica rum 30, water 150, and syrup 150 grams.—Amer. Jour. Pharm., March 1886, 113.

Chinojodin—Source and Constitution.—It is stated in "Amer. Drugg." (April 1886, 76) that "chinojodin" is an addition product of chinoline (quinoline; C_9H_7N) the molecule ICl (chloride of iodine) having been joined to it. Its composition is therefore, C_9H_7NICl . It is light-yellow, micro-crystalline, insoluble in water, and difficultly so in alcohol, ether, and other solvents. It strongly resembles chinoline in odor and taste.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Salicin—Solubility in Water.—In papers on solubility formerly contributed, Mr. D. B. Dott had urged the importance of preparing the solution at the temperature at which the determination is to be made, having observed that when the solution is cooled from a higher temperature the solubility found is invariably greater than when ascertained by the former method. Experiments now made with salicin confirm his previous observations. They lead him to the conclusion that by the method of "cooling" the supersaturated solution, the results are not alone greater even if the solution has stood at the required temperature

for a considerable time, but are absolutely fallacious if allowed to stand only a few hours, as is customary. He has made the following determinations of the solubility of salicin in water at different temperatures by the method of "digestion:"

°C.	1 part salicin is soluble in	34.74 parts water.
6°	" "	31.76 "
11°	" "	29.40 "
15°	" "	28.10 "
29°	" "	21.00 "
48°	" "	11.50 "
56°	" "	9.01 "
59°	" "	7.66 "
65.5°	" "	6.90 "
75°	" "	3.82 "
82.5°	" "	2.12 "
88°	" "	1.31 "
90°	" "	1.25 "
95°	" "	1.17 "
102°	" "	0.68 "

It is interesting to note that the solubility increases directly with the temperature to about 50°C., and from that point the rate of increase diminishes.—Pharm. Jour. and Trans., Jan. 23, 1886, 621-622.

Saponin—Composition of the Commercial Article.—According to Dr. Kobert commercial saponin consists usually of a mixture of at least four organic and some inorganic substances. The pure saponin ($C_{13}H_{30}O_{10}$) is said to be perfectly inert, and consequently not the source of the toxic property attributed to commercial saponin. A second constituent is

Lactosin, a carbohydrate discovered by Mr. A. Meyer, and also inert. The third and fourth constituents are

Quillaic acid and

Sapotoxin, both very poisonous, and to them is due the acrid taste of saponin. In preparing quillaic acid from quillaya bark, a decoction is precipitated by neutral acetate of lead. After removal of the lead from the well washed precipitate and evaporating, the residue is taken up with absolute alcohol, the filtrate evaporated, and this residue taken up with a mixture of five parts of chloroform and one of alcohol, which separates much coloring matter. From the filtered solution ether precipitates quillaic acid in snow-white flocks, which should be dried over sulphuric acid. The acid and its neutral salts are so toxic as to be fatal to dogs when administered subcutaneously in doses of 0.5 gram per kilogram of body weight, or by the mouth in four times that proportion. Analysis gave figures corresponding with the formula attributed to saponin, and since quillaic acid loses its toxic properties through boiling it with baryta solution to dryness several times, the author thinks that saponin may be an

inactive modification of quillaic acid.—Pharm. Jour. and Trans., Oct. 31, 1885, 366; from Pharm. Post, Oct. 24, 1885, 1151.

Saponin.—Occurrence in the fruit capsules of *Illicium anisatum*, which see under “Materia Medica.”

Digitalin, Digitalein and Digitin—*New Method of Preparation and Separation*.—The following method for the preparation and separation of the glucoside of digitalis—which is applicable also for the preparation of *picrotoxin* and *solanine*—is given in Phar. Zeitschr. f. Russl. (xxiv. 561):—Digitalis is exhausted with water and the infusion is decolorized with animal charcoal, treated with acetate of lead, and filtered. The filtrate is then treated with a mixture of 12 parts of liquor plumbi subacetatis and 1 part of spirit of ammonia (Liquor Dzondii). The precipitate, consisting of oxide of lead and the glucosides of digitalis, is washed on a filter, then made into a soft paste with water, and sulphuretted hydrogen passed into it. It is again placed on a filter; the filtrate contains all of the digitalein; but digitin and digitalin, being almost insoluble in water, remain on the filter together with the sulphide of lead. Chloroform dissolves the digitalin, and alcohol the digitin. Pure digitalin and digitin are obtained by evaporating the respective solutions.—Amer. Jour. Phar., Dec., 1885, 607.

Digitalin—*Characteristic Reaction*.—According to Lafou, a trace of digitalin can readily be detected by mixing the suspected substance with a mixture of equal parts of alcohol and sulphuric acid, heating until a yellow coloration is produced, and then adding a drop of solution of chloride of iron; if digitalin is present, a blue-green color is produced, lasting for several hours. This reaction is very delicate; the coloration produced by 1 milligram of digitalin is very distinct.—Amer. Jour. Phar., Nov. 1885, 551, from Schweiz. Wochenschr.

Santonin.—Yield at different periods of the growth of *Santonica*, which see under “Materia Medica,” page 414.

Santonin—*Commercial Purity*.—Mr. Joseph T. Beck has examined no less than fifty-seven samples of santonin purchased in different cities, both by the pharmacopœial and other tests, and has found them, with two exceptions, to be quite pure and free from foreign substances.—Pharm. Rec., June, 15, 1886, 182; from Proc. Ohio State Pharm. Assoc., 1886.

Santonin—*Derivatives*.—Mr. V. Villavecchia communicates the results of his experiments upon certain derivatives of santonin.

Photosantonin acid, $C_{15}H_{22}O_5$, is best obtained by exposing a solution of 10 grams santonin in a liter of acetic acid (sp. gr. 1.06) to the action of light for about a month; the product is evaporated to a syrupy consistency in a vacuum, the residue washed with water, and then treated with a warm solution of sodium carbonate. The undissolved residue may be dissolved in alcohol, from which it crystallizes in prisms, melting at

182–183°, and of the composition $C_{17}H_{22}O_6$, namely, 1 mol. santonin + 1 mol. acetic acid. On adding hydrochloric acid to the sodium carbonate extract, photosantoninic acid separates, and is purified by repeated crystallization from alcohol. Its properties agree with those assigned to it by Sestini (1877).

Photosantonin, $C_{17}H_{24}O_4$, is best prepared by exposing a solution of santonin (20 grams) in alcohol (1 litre) to the direct action of light for three months. The alcohol is distilled off in a vacuum, and the thick residual oil treated with lukewarm sodium carbonate solution to remove photosantoninic acid. On treating the insoluble portion with ether, two isomeric photosantonins, $C_{17}H_{24}O_4$, are obtained; one modification forms platy crystals, melting at 154–155°, and is dextrorotatory; $[\alpha]_D = +76.77^\circ$ for a solution containing 0.3825 gram in 50 cc. alcohol at 13°. The other modification, which is the chief product, melts at 68–69°, and is identical with Sestini's photosantonin.

Ethyl-dehydrophotosantonate, $C_{13}H_{11}(\text{COOEt})_2$, a diethyl-derivative of an acid containing the elements of a molecule of water less than photosantoninic acid, is obtained when gaseous hydrogen chloride is passed into a solution of photosantoninic acid in absolute alcohol. It forms a colorless liquid, which does not solidify at -10° . A solution of 0.7306 gram in 25 cc. alcohol has a dextro-rotatory power at 20.4° , $[\alpha]_D = +20.4^\circ$. The free acid, which is isomeric with dehydrated photosantoninic acid, melts at 132–133°. It is very readily soluble in alcohol and ether; its dextro-rotatory power is $[\alpha]_D = +31.9^\circ$ for a solution containing 0.7114 gram in 50 cc. alcohol. The barium salt, $C_{13}H_9O_4\text{Ba}$, is very readily soluble.—*Jour. Chem. Soc.*, 1886, p. 73; *Berichte D. Ch. Ges.*, 1885, pp. 2859–2864.

Santonin—Emmenagogue Properties.—The experience of Dr. M. Whitehead indicates indubitably that santonin possesses excellent emmenagogue properties. He employed it at first in a case of chloroanæmia, and has subsequently given it in numerous cases of amenorrhœa with almost invariable success.—*Pharm. Jour. and Trans.*, Oct. 3, 1885, 287; from *Lancet*, Sept. 5, 1885, 430.

Calcium Santonicum—Superiority over Santonin as a Vermifuge.—Mr. Bombelon states that santonin occurs in wormseed as a lime compound, which, although difficultly soluble when separated in a pure condition, is maintained in the flower-heads in a soluble condition by the associated extractive matter. By saturating hot milk of lime with santonin, and evaporating to dryness, the compound “calcium santonicum” is obtained as a white, tasteless powder, insoluble in water. This compound the author considers to be better adapted for use as a vermifuge than santonin, since it is not so easily absorbed by the stomach, and he says he has found it more effective in equal doses, whilst the absence of taste suits it

for the preparation of lozenges. The compound should be neutral, and should give up nothing to chloroform.—Pharm. Jour. and Trans., Oct. 3, 1885, 287; from Pharm. Zeitg., 1885, 743.

Aloin—Detection in Animal Secretions and Excretions.—Dr. Justus Dietrich has studied the detection of aloin in animal secretions and excretions, and found the following reactions serviceable for this purpose:

HNO_3 , KCy.—The residue left on evaporating the alcohol solution was dissolved in a few drops of nitric acid, the solution evaporated by means of a steam bath, dissolved in alcohol, and the deep red solution treated with a drop of alcoholic solution of potassium cyanide, which produced a rose color with different aloins.

In the following tests the aloin residues were dissolved in a little water:

Chloride of gold produced with barbaloin a raspberry red color (still recognizable with 0.00006 aloin) after some time changing to violet. Soc-aloin and cape-aloin gave a rather faint color, rapidly changing to violet; nataloin red violet, rapidly turning to violet; Curaçao-aloin bright red.

Bromated potassium bromide gave a distinct turbidity with the aloins of Barbadoes, Socotra and Curaçao; none with Port Natal or Cape-aloin.

Tannin gave a turbidity only with barbaloin, probably due to a decomposition product.

For the detection of aloin the fæces were digested with water acidulated with sulphuric acid, then macerated for 12 hours with three volumes of strong alcohol, the filtrate concentrated, and the residue successively agitated with petroleum benzin and amylic alcohol; on evaporating the latter, aloin was left. The treatment of blood and urine was similar. From his results the author concludes that on taking aloes or aloin, the greater portion is excreted with the fæces; a small portion only is absorbed and passes mostly through the kidneys, while the remainder enters the liver and with the bile is conveyed back into the intestines.—Amer. Jour. Phar., Aug. 1885, 404; from the author's thesis, Dorpat, 1885.

Colocynthin—Conversion into Elaterin and Bryonin, and Distinction.—According to Mr. E. Johansson, colocynthin when heated with dilute sulphuric acid yields colocynthein, elaterin, and bryonin.

Colocynthin is soluble in water and alcohol; it gives an orange color changing to red with concentrated sulphuric acid, a cherry-red coloration with sulphuric acid containing molybdic acid, a blood-red coloration turning blue at the edge with sulphuric and vanadic acids, a yellow coloration with alcohol and sulphuric acid, distinguishing it from solanine and solanidine, and a yellow coloration with sulphuric and selenic acids; moistened with phenol and a drop of sulphuric acid, it gives a blood-red coloration changing to orange.

Colocynthein is not as soluble in water as colocynthin; it is only spar-

ingly soluble in light petroleum, but easily in benzene. With molybdc and sulphuric acids, it remains at first unchanged, but finally becomes a dirty cherry-red. With vanadic and sulphuric acids, its reactions resemble those of colocynthin. Colocynthin and colocynthein may be separated by shaking the acid solution with benzene, which dissolves the colocynthein, and afterwards with ethyl acetate, which dissolves the colocynthin.

Elaterin is insoluble in water ; it is sparingly soluble in cold, but easily in boiling alcohol ; it crystallizes in colorless, shining, six-sided plates. With concentrated sulphuric acid, it gives a pale yellow coloration, becoming red at the edges after some time, and finally cherry-red. Molybdc and sulphuric acids give a fugitive green color. Phenol and sulphuric acid give a momentary red coloration. Vanadic and sulphuric acids give a fine blue, changing to a bright green color. Selenic and sulphuric acids give a red color, not so intense as that produced by concentrated sulphuric acid alone. Alcohol and sulphuric acid give on warming only a faint yellow color. When evaporated on the water-bath, and then treated with sulphuric acid, a violet-red coloration is obtained. The elaterin reactions are slow, and with the exception of the characteristic vanadic and sulphuric acids tests, unsatisfactory.

Bryonin, in its reactions, resembles colocynthin and elaterin, and is readily soluble in water and alcohol. Selenic and sulphuric acids give a dirty cherry-red, and vanadic and sulphuric acids a blue violet color. — Amer. Jour. Phar., Sept. 1885, 451 ; Zeitschr. Anal. Chem., Vol. 24, 154-157 ; Jour. Chem. Soc., 1885.

Convolvulin and Jalapin—*Detection and Separation in Excretions*.—These resins, after having been taken internally, could not be detected by Bernatzic (1862) in the urine, and in the fæces only after very large doses had been given. Köhler and Zwicke (1869) succeeded in proving their presence in the contents of the stomach and intestines. In a series of experiments with cats, made by Dr. J. Müller, the compounds named or their derivatives were shown to be absent from the fæces, urine, kidneys, and bladder ; the reactions were quite distinct with blood, stomach, jejunum and ileum, faint with duodenum and the large intestines, and very faint with heart, lungs and spleen. A cat having been killed five hours, after taking 0.5 gm. jalapin showed a relatively distinct reaction in the blood ; but the different organs gave either a very faint reaction or none.

The process for separating the resins was selected after a series of experiments as follows: the mass was macerated for a day with 3 times its weight of 96 per cent. alcohol, the filtrate concentrated, acidulated, agitated with petroleum benzin for the removal of impurities, and afterwards with chloroform, on the evaporation of which the resin was left behind. Blood treated in the same manner leaves a residue giving the same reaction, but after treating this residue with absolute alcohol, filter-

ing and evaporating, the residue left from blood does not show the reaction, except in the presence of the resins named. The test used for the color reaction was concentrated sulphuric acid, about 10 drops, which dissolves the resins; the solutions on the careful addition of water show a red color within a few minutes, which however disappears rapidly; but if the solution be allowed to absorb moisture from the atmosphere, the reaction takes place slowly in about an hour and continues for a longer time.—*Amer. Jour. Phar.*, Sept. 1885, 456; from the author's thesis, Dorpat, 1885.

Asparagin—Occurrence in Hops.—Messrs. Bungener and Fries have shown that hop contains about 1 per cent. of asparagin, the nitrogen of which is equal to 30 per cent. of the total nitrogen in hops.—*Chem. Ztg.*, 1885, No. 86; *Zeitsch. Brauw.*, No. 13.

Glycyrrhizin—Occurrence in Myrrhis odorata, which see under “*Materia Medica.*”

Calumbin—Physiological Action.—This bitter principle has hitherto been represented as possessing little physiological activity. Mr. Houdé, however, now reports some physiological experiments made with the pure crystalline principle, which point to its being a somewhat energetic substance, giving rise to vomiting and diarrhœa. In small doses it appears to augment the secretion of bile, of the glands of the stomach and the intestines; after full doses the liver appeared to undergo fatty degeneration. A dose of 10 centigrams administered to fowls caused death, preceded by digestive disturbance and frequent evacuations. It is thought that if calumbin were not present in calumba in only small amount (0.35 to 0.4 %), it would prove an inconvenient constituent in the administration of the drug.—*Phar. Jour. and Trans.*, April 3, 1886, 839; *Rép. de Pharm.*, March, 1886, 113.

Absinthin—Crystalline Form, etc.—Mr. Duquesnel has obtained absinthin in a crystalline form. The crystals form colorless prisms, have no odor and are intensely bitter. Absinthin augments or restores the appetite, and is purgative. It is best administered in globules, mornings and evenings before meals.—*Amer. Jour. Pharm.*, March, 1886, 128; from *Répertoire de Pharmacie*, 1886, xlii, p. 15.

Arbutin—Occurrence in the Leaves of Vaccinium Vitis-Idæa, and Possibly Also in the Fruits of V. macrocarpon (cranberries), which see under “*Materia Medica.*”

Populin—Medicinal Use.—It is stated in “*Med. World*” that populin, the bitter principle of white poplar and other species of *Populus*, acts like a charm in painful micturition and scalding. The dose ranges from two to four grains.—*Amer. Jour. Pharm.*, April 1886, 163.

Acorin.—The bitter principle of *Acorus Calamus*, which see under “*Materia Medica.*”

Helenin.—*Value in the Treatment of Diphtheria*.—Dr. Juan Beltran Obiol has employed helenin successfully in the treatment of diphtheria. The plan adopted was to apply powdered camphor to the diphtheritic patches, and then paint them over with a solution of helenin in sweet oil of almonds. This application, repeated every four hours, quickly led to the destruction of the false membrane. When the treatment was commenced on the first day that the patches appeared, a single day was sufficient to effect a cure; if on the second day, two or three days were necessary; if on the third or fourth day, six to nine days were required. If not applied until the fifth or sixth day, there was not much hope of cure. The author remarks that it is necessary to ascertain the purity of the helenin employed. It should be white and flocculent, like sulphate of quinine, and should possess an aromatic odor and bitter taste. It is insoluble in water, which it does not render opalescent, but is very soluble in alcohol and in ether, forming clear solutions. Almond oil dissolves 2 per. cent. If it does not answer these tests it is not fit for use in diphtheria.—Pharm. Jour. and Trans., May 1, 1886, 919; Lancet, April 10, 1886, 708.

Aurantiamarin.—A new bitter principle from *Bitter Orange Peel*, which see under "Materia Medica."

Vanillino.—*Preparation from Olivil*.—Artificial vanillin is prepared in Milan from olivil (the resin obtained from the olive tree) by treating an alkaline solution of the resin with potassium permanganate. When the reaction ceases, an excess of sulphuric acid is added. The vanillin thus formed is extracted by steam or by shaking with ether.—Phar. Centralhalle, xxvii, 74; Amer. Jour. Pharm., April 1886, 167.

Vanillin.—Proposed use for the preparation of *Tincture of Vanilla*, which see under "Pharmacy."

Vanillin and Coumarin.—Use for deodorizing *Iodoform*, which see under "Alcohols."

Adonidin.—Occurrence in *Adonis cupaniana*, which see under "Materia Medica."

Adonidin.—*Preparation, etc.*—Mr. Jean Mordagne has made some researches on *Adonis vernalis*, and particularly on the glucoside, adonidin, discovered by Cervello in 1882. The parts of the plant operated upon were the leaves and stalks, the process being as follows: The drug being dried at 40° C. for several days, whereby it loses one-fifth of its weight, is macerated for 5 days with 5 times its weight of 50° alcohol. The liquor is decanted, the alcohol recovered by distillation, and the residual liquor treated with basic acetate of lead, whereby the greater part of the coloring matter, aconitic acid, and a pitchy matter, probably resulting from the resinification of an essential oil observed in the leaves, are removed. The filtrate is now treated with solution of carbonate of sodium

to remove excess of lead, the brown filtrate is rendered alkaline with a few drops of ammonia, and the glucoside is precipitated by means of a strong solution of tannin. The tannate of adonidin, which is bitter and soluble in a large quantity of water, is dried between blotting paper, and then mixed with very pure, finely pulverized hydrated oxide of zinc, or of lead, so as to form a homogeneous powder. This is suspended in 90° alcohol, gently heated during several hours, and the alcohol then distilled off. The residue is then treated with absolute alcohol, and the mixture filtered, the filtrate decolorized as much as possible with animal charcoal, and then ether added, which causes the precipitation of some foreign matter, as well as traces of adonidin. Finally, it is cautiously evaporated, and the residue, spread out in thin layers, is exposed in a vacuum together with chloride of calcium or sulphuric acid. Ten kilograms of the drug yielded scarcely two grams of dry substance.

Adonidin is described by the author as a canary yellow amorphous powder, but he states that under certain conditions it may be obtained as a diffuse and radiating crystalline mass. It is freely and persistently bitter, rather soluble in water, but only slowly so; soluble in alcohol and amylic alcohol, but insoluble in anhydrous ether, chloroform, oil of turpentine, and benzin.—Pharm. Jour. and Trans., Aug. 15, 1885, 145–146; Bull. de la Soc. de Pharm. de Sud-Ouest, July 1885.

Adonidin—Physiological Action.—Dr. H. A. Hare gives the following conclusions derived from an experimental study of adonidin:

Adonidin in all doses increases arterial pressure by stimulating the vasomotor centres, and by increasing the cardiac force. In moderate doses it increases the pulse-rate and force from the first, but when large toxic doses are given, it primarily slows the heart by stimulating the pneumogastric, and then increases the pulse-rate by depressing the inhibitory nerves, and stimulating the accelerator apparatus. The slowing of pulse-rate is in all probability due in part to increased arterial pressure, as under these circumstances the blood-paths are greatly diminished in calibre. On the nervous system the drug has but little action, unless the quantity administered be enormous. Under these conditions it paralyzes the sensory side of the cord, but has no effect on the motor tract, or on the efferent or afferent nerve trunks.—Amer. Jour. Pharm., June 1886, 293; from Therapeutic Gazette, April 15, 1886.

Andrometoxin—Occurrence in Various Ericaceous Plants.—Prof. P. C. Plugge has found the following plants, belonging to the *Ericaceæ*, to contain *andrometoxin*, a colorless, odorless, distinctly crystalline poisonous substance, which the author had originally isolated from *Andromeda japonica*, Thunb. (see Proceedings, 1884, p. 149). It is present in greater or less quantities in:

1. The leaves and wood of *Andromeda japonica*, Thunb.
2. The leaves and young twigs of *Andromeda polifolia*, L.

3. The leaves and flowers of *Andromeda Catesbæi*, L.
4. The leaves and young twigs of *Andromeda calyculata*, L.; *Cassandra calyculata*, Don.
5. The leaves and young twigs of *Andromeda polifolia angustifolia*.
6. The leaves and flowers of *Azalea indica*, L.
7. The leaves and flowers of *Rhododendron maximum*, L.

The author gives the details of the treatment of the substances containing andrometoxin in each case, except in the case of the last-named plant, which will be subject for further experiment and report.—Arch d. Phar., Dec. (1) 905-917.

Asclepiadin—*Occurrence in Different Plants Belonging to the Asclepiadiaceæ*.—Dr. Gram, working upon *Asclepias curassavia*, *A. incarnata* and *Vincetoxicum officinale*, found all these three plants to contain an active principle of a glucosidal character, which he has named *asclepiadin*, and appears to consider a purer form of the “asclepiadin” of Harnack and the “asclepin” of Feneulle. The new substance was yellowish, amorphous, and when freshly prepared was freely soluble in water; but either in solution or in the dry state it is quickly decomposed, and the residual compound becoming in proportion insoluble in water and inert. From the ethereal solution crystals gradually separated, apparently identical with List’s “asclepin” and quite inactive physiologically. The physiological action of asclepiadin was found to closely resemble emetin, but in view of the instability of the compound, Dr. Gram doubts whether it can be advantageously introduced into medicine. Arch. Exp. Path. u. Pharm., xix. 389; Phar. Jour. and Trans., Aug. 29, 1885, 185.

Cyclamin—*Products of Decomposition*.—Prof. A. Hilger has studied the character of the products of the decomposition of *cyclamiretin*, the product formed by the splitting of cyclamin by the action of acids. Besides a body resembling colophonium, and a volatile oil, the products of the decomposition of cyclamisetin by melting alkali appear to consist principally of butyric and formic acids.—Arch. d. Pharm., Nov. (1) 1885, 831-832.

Scopolein—*Character of a Commercial Article So-called*.—Mr. Hentschke has examined a brown syrupy preparation from the root of *Scopolia japonica*, sent out by a German house under the name of *scopolein*, which was found to contain atropine as the essential alkaloidal constituent. The examination of the accompanying substances has not yet been completed.—Pharm. Jour. and Trans., Oct. 31, 1885, 365; from Chem. Zeit., Oct. 4, 1885, 1432.

Scopolein.—Identity with *Chrysotropic acid* from *Atropa Belladonna*, which see under “Materia Medica.”

Strophantin—*Isolation and Characters*.—This principle was isolated by Hardy and Gallois, from the seeds of a species of *Strophantus*, an

apocynaceous woody climber, used in preparing the arrow-poison *iné*. The principle forms colorless neutral crystals, is soluble in alcohol and water, and was ascertained to be a heart poison. Experiments made with it in Edinburgh, show it to be physiologically allied to digitalin; it has been used hypodermically in doses of $\frac{1}{16}$ to $\frac{1}{6}$ grain.—Amer. Jour. Pharm., Dec. 1885, 630.

Danain.—A glucosidal constituent of *Danais fragrans*, which see under “Materia Medica.”

Baptisin and Baptin.—Two glucosides from the root of *Baptisia tinctoria*, which see under “Materia Medica.”

Anemonin.—Formation in *Ranunculaceous plants*, which see under “Materia Medica.”

Nerolin.—A New Concentrated Perfume.—Under the name of nerolin, Messrs. Schimmel & Co. have placed on the market a white crystalline powder, soluble in 30 parts of 95 per cent. alcohol and in 25 parts of the fixed oils, sparingly soluble in water, as a substitute for the expensive oil of neroli. One part of nerolin is equivalent to ten parts of the oil. Several soap manufacturers use nerolin in the proportion of 20 to 30 gm. to 100 kilos of soap.—Amer. Jour. Pharm., Dec. 1885, 604; from Pharm. Centralhalle, xxvi No. 43.

COLORING MATTERS.

Green Coloring Matter of Plants—Removal by Barium Hydrate.—The solubility of the green coloring matter of plants in many of the ordinary solvents sometimes involves a practical difficulty in isolating other plant constituents. According to Dr. Tschirch, this may be overcome by the treatment on a water-bath of an alcoholic extract with solution of barium hydrate, which precipitates the green coloring matter as an insoluble compound of barium with cyanophyllinic acid. This compound is also insoluble in water, and if the precipitate be dried at 100° C., it also becomes insoluble in ether and in benzin (benzol?—Rep.). Dried at a lower temperature, the compound can be obtained in black-looking scales that dissolve in ether with an emerald green color. The corresponding sodium compound is soluble in alcohol and in water. The author suggests that the barium compound would be suitable to the quantitative determination of the green coloring matter of leaves.—Pharm. Jour. and Trans., Oct. 31, 1885, 367; Chem. Ztg., Oct. 4, 1885, 1431.

Chlorophyll—Action on Drying Oils.—Mr. V. Jodin has made a series of experiments on the effect of associating chlorophyll or its elements with certain vegetable oils. He finds that if a comparatively minute proportion of chlorophyll be mixed with drying oils, such as that of linseed, the oil becomes nearly unoxidizable if kept in the dark, and can remain for some months in contact with oxygen without absorbing a

notable quantity. In the light, however, the oil recovers its affinity for oxygen, increased apparently by the presence of the chlorophyll.—Pharm. Jour. and Trans., Feb. 27, 1886, 725; Compt. Rend.

Red Coloring Matter of Wines and Other Vegetable Coloring Matters—Characters of Distinction.—Mr. Terreil communicates a paper on the distinctive characters of the several red coloring principles in plants, which are briefly given as follows :

1. The red coloring matters that are precipitated under the influence of hydrochloric acid, and are soluble in alkalis, which color them *green*. This is the most numerous class.

2. The red coloring matters that are precipitated by hydrochloric acid, and are soluble in alkalis, which color them *violet*. In this class are to be found the reds of dye-woods and orchil, as well as of cochineal.

3. The red coloring matters that are precipitated by hydrochloric acid and are soluble in alkalis, which color them *blue*. Litmus is, hitherto, the only substance that presents this character ; there are, however, certain red or rose-colored flowers, the colored juice of which becomes blue under the influence of ammonia.

4. The red coloring matter that hydrochloric acid alters without precipitating them, such as the red of *Phytolacca*, and that of the beet.

In order to recognize quickly the nature of the red coloring matter contained in any vegetable substance, the author crushes the substance between leaves of unsized paper, so as to cause the colored juice to stain the paper, and then exposes it to ammonia vapor, under the influence of which the color is changed to green, violet, or blue. Operating in this way he has ascertained the changes in color that the juice of the following plants undergo when exposed to ammoniacal vapor :

Rose	changes to	bright green.
Cherry laurel	"	bright yellow green.
Dark violet marguerite	"	dark green.
Fuchsia, violet petals	"	green.
" sepals	"	azure blue.
Geranium	"	blue with greenish tinge.
Pomegranate flower	"	violet blue.

In examining the coloring matter of wine, the author heats about 5 cc. so as to drive off the alcohol, then adds an equal volume of hydrochloric acid, and boils the mixture. After two or three minutes' boiling the liquid is thrown upon a filter, and the red-brown precipitate produced is washed with distilled water ; the filter is then crushed between unsized paper, and afterwards opened out and exposed, still moist, above a flask containing ammonia. If the matter on the filter turn green it is assumed that the coloring principle has been derived from the grape, or from a vegetable substance containing the same coloring principle as the grape ; but at present it is impossible to say with certainty what substance has

yielded the color.—*L'Union Pharm.*, Aug. 1885; *Pharm. Jour. and Trans.*, Sept. 19, 1885, 246.

Carminc-red—*Yield and Characters, etc.*—Messrs. W. Will and H. Leyman obtained from 5 kilos of silver-gray cochineal between 400 and 500 gm. of pure carmine red. Dissolved in 50 per cent. acetic acid and boiled with excess of bromine, colorless needles of $C_{10}H_7Br_4O_3$, are obtained, which are insoluble in water, readily soluble in alkalies, and sparingly soluble in hot alcohol, benzol or glacial acetic acid. The acetic mother-liquor yields with water yellow amorphous floccules, readily soluble in alcohol, benzol and ether, and yielding, on boiling with concentrated potassa solution, a red pulverulent salt, the acid of which, when liberated crystallizes in yellow glossy needles, having the composition $C_{11}H_5Br_3O_4$, and which has no tinctorial properties; but all its salts are strongly colored. On treating the alkali solution with stannous chloride, and then supersaturating with hydrochloric acid, ether will extract a substance, the solution of which, on exposure to the air, acquires a color similar to that of a cochineal solution, and like the latter becoming violet-red on the addition of alkali.—*Amer. Jour. Pharm.*, Feb. 1886, 91; from *Ber. D. Chem. Ges.*, 1885, 3180-3193.

Carmine, Characters, etc.—See *Cochineal*, under “*Materia Medica.*”

Anchusin—*Value as an Indicator in Place of Litmus.*—See *Alkanet*, under “*Materia Medica.*”

ALBUMINOIDS.

Albumen—*A New Reaction.*—Mr. D. Oxenfeld observes that if a solution containing albumen be acidulated with formic acid, and a solution of gold chloride (0.1%) be added drop by drop, the mixture being warmed, bubbles of gas are formed on the sides of the test-tube; the solution turns first rose-red, and then assumes a beautiful purple-red; on further addition, a blue color; finally, a blue flocculent precipitate separates out. The rate of change to blue is in proportion to the dilution of the solution of albumen. The blue or violet coloration is also caused by other organic substances, such as grape sugar, starch, glycerin, leucin, tyrosin, creatin, uric acid, and urea. Pure gelatin gives a dichroic brown or reddish coloration. Impure gelatin (probably containing albumen) gives, when sufficiently concentrated, the purple color. Gum solutions give also a beautiful purple-red coloration, which differs, however, from the albumen reaction by changing to orange-yellow on the addition of potash or soda. The reaction can be made to succeed with pure albumen solution of a dilution of 1 to 1,000,000. The presence of salt, urea, uric acid, or grape sugar, does not interfere, when not present in excess; otherwise it is only necessary to use more formic acid and gold chloride.—*Amer. Drugg.*, Nov. 1885, 216; from *Centralbl. f. d. Med. Wiss.*

Egg Albumen—Influence of Salts on Coagulating Point.—Mr. Varenne communicates some interesting observations as to the influence exercised by variable quantities of different salts upon the coagulating point of egg albumen. The author recognizes two distinct coagulating points for egg albumen. The lower is indicated when a fresh egg, beaten up in 600 or 700 cc. of distilled water, is heated to a temperature of 60° C., by a more or less dense turbidity; the higher is characterized by the formation of flocks at the temperature of 75° C., the two phenomena, it is suggested, being due to the successive coagulation of paraglobuline and serine. The author divides the salts experimented with into three classes: (1) *Indifferent*, including chlorate of potassium, molybdate of ammonium, sulphate of sodium, and sulphate of manganese. (2) *Retarding Coagulation*, including chloride of sodium, sulphate of magnesium, hyposulphite of sodium, iodide of potassium, iodide of mercury dissolved in iodide of potassium, arsenate of sodium, borate of sodium, and sulphate of iron. (3) *Favoring Coagulation*, including sulphate of cadmium, acetate of uranium, sulphate of copper, chloride of barium, nitrate of barium, nitrate of urea, and tartar emetic. So considerable are the modifications in these coagulating points produced by certain salts, that in certain cases coagulation takes place in the cold (cadmium, uranium, copper and urea salts) while in others it does not take place at 100° C. (sulphate of iron).—Phar. Jour. and Trans., Jan. 30, 1886, 643; Compt. Rend., cii. 129.

Albumen—Detection in Urine.—Mr. Roberts recommends a mixture of 1 vol. of concentrated nitric acid and 5 vol. of saturated solution of sulphate of magnesium as preferable to nitric or picric acid.—Amer. Jour. Phar., Jan. 1886, 18; from Rundschau, xi. p. 754.

Albuminate of Iron—New Process of Preparation.—Mr. De Groot prepares a stable and definite albuminate of iron as follows: Make a 10 per cent. solution of dried egg albumen, and filter. Add a dilute solution of sublimed ferric chloride, until the albuminate of iron at first precipitated is entirely re-dissolved, by active stirring, in the excess of ferric chloride. Subject the resulting solution, which has a very astringent and saline taste, to dialysis, until it no longer gives the chlorine reaction with nitrate of silver. In this manner, the whole of the excess of ferric chloride, free hydrochloric acid, and other salts, particularly the chlorides of sodium and potassium (which might precipitate the albumen) are eliminated. Next reduce the whole to a definite weight. Since the liquid, in consequence of the large quantity of albumen it contains, becomes very viscid on evaporation, the author adopts for his dialyzed solution of albuminate of iron, the strength of 1 part of ferric oxide (Fe_2O_3) in 500 parts of the solution. The finished solution has a specific gravity of 1.010, is perfectly clear, has a slightly acid reaction, and a sweet and agreeable taste provided the proportion of iron above-mentioned is in solution in

the state of albuminate. The solution remains unaltered for a considerable time, even in partly filled bottles. Neither heat nor the addition of alcohol changes it, and alkalies or even small quantities of acids may be added to it without affecting it. A solution of chloride of sodium, however, precipitates the albuminate, and from the latter the albumen is separated by small quantities of acid. On evaporating the solution at a temperature not exceeding 40° C., a dry product may be obtained, containing 2.5% of iron. But as the compound in its dry form is soluble only with difficulty in the stomach, the author prefers the solution.—*Amer. Drugg.*, April, 1886, 65; from *Journ. de Ph. d'Anvers*.

Sublimated Serum and Sublimated Albumen—Use for Surgical Dressings.—Mr. Henry William Jones communicates his experience in the preparation of corrosive sublimate gauze, the non-irritating “sublimated serum” and “sublimated albumen” being employed for its preparation. He concludes that for practical uses there is no difference between the two, and that the “albuminated mercury” is best made from dried egg albumen, the process being about as follows: 100 grams of coarsely powdered egg albumen are shaken with 900 cc. of water until dissolved; the liquid is then diluted to a sp. gr. 1.020, such containing in round numbers about 7 per cent. of dry matter. On addition of 10 grams of mercuric chloride to 1000 cc. of this solution, a thick mixture is produced, which contains albumen in excess. With this the gauze is prepared as recommended by Sir Joseph Lister.—*Yearbook of Pharm.*, 1885, 430-435.

Blood—Detection in Urine.—A new, sure, and simple method by means of which the peculiar color of blood is obtained, is given by Antonio Luchini. To 10 cc. of urine, in a test-glass, add one drop of acetic acid and 3 cc. of chloroform, and shake well. In the presence of blood, the subsiding chloroform will show more or less of the red blood-tint, according to the quantity of blood present. Luchini experimented with personally prepared solutions of blood, and observed the reaction to be successful with a solution containing 3 drops of blood in 250 cc. of water.—*Schweiz. Wochenschrift f. Ph.*, 1885, p. 220; from L'Orosi; *Amer. Jour. Phar.*, Oct. 1885, 503.

Pure Pepsin—Preparation and Characters.—Mr. C. Sundberg has prepared pure pepsin, free from albumen, by destroying the “rennet-ferment” by means of heating to 40° C. (104° F.), during which operation any albumen still present is also converted into “pepsin.” The pepsin solution thus obtained is mixed with calcium chloride and sodium phosphate, then neutralized with very dilute ammonia, and this operation repeated several times, until a precipitate is no longer produced. This precipitate, consisting of calcium phosphate and pepsin, is washed with water, dissolved in the smallest possible quantity of 5% hydrochloric

acid, and then dialyzed until the contaminating salts are removed. The clear, colorless solution finally obtained excels the original solution in digestive power. When tested qualitatively with reagents for albumen, the solution gave negative results. The only agent which precipitated the pepsin was absolute alcohol, which did not, however, diminish its digestive power, except when allowed to be in contact with it for a long time, in which case it became insoluble and inert. These results render it very probable that pepsin is a modification of albumen.—*Amer. Drugg.*, Aug. 1885, 148; from *Zeitsch. f. Phys. Chem.*, 1885, 319.

Pepsin—Examination of Commercial Samples.—Mr. William F. Ranke, Jr., has examined twenty samples of dry pepsins and two samples of liquid pepsins of different brands by the process of the U. S. Pharm., and has reported his results to the Mich. State Pharm. Assoc.—*Proceedings* 1885, 126-130.

Pepsin—Combination with Bismuth in form of an Elixir, which see under "Pharmacy."

Pepsin—New Method of Administration.—Dr. Prosser James describes a combination of pepsin with salt which he has devised in order to secure the pepsin being taken at the time it is required, that is, with the food on which it is to act. A simple mixture of pepsin with salt may be successfully employed as a digestive condiment, provided it be freshly prepared each time; for such a mixture, if kept, is apt to decompose, and the patient who has once observed this will take no more of the putrefying powder. To overcome this difficulty, the doctor says the pepsin and the chloride must be brought together in such a way that possibly a compound, or peptochloride, may be formed. Whether such union occur or not, a powder thus prepared is quite stable.—*Amer. Drugg.*, Aug. 1885, 150; from *Brit. Med. Journ.*

Papain—Digestive Value of Commercial Samples.—Mr. E. J. Eastes communicates the results of some comparative experiments made with two samples of papain—designated respectively *A.* and *B.*—upon fibrin, albumen and milk. *A.* was a white, amorphous, non-hygroscopic, nearly odorless powder, which dissolved almost entirely in water, forming a slightly turbid solution which kept sweet for many days.

B. was a coarse brown powder with a rather strong smell. It partially dissolved in water, giving a brown solution and leaving a large proportion of insoluble slightly gritty residue. The aqueous solution had a peculiar smell which increased from day to day.

Moist Fibrin (raw lean beef,) was digested with 0.125 % of its weight of papain for 3 days at a temperature of 98° F. *A.* dissolved 400 times its weight of the raw meat. *B.* dissolved 100 times its weight. Water alone dissolved 75 % of the beef. *Pure dry fibrin*, subjected to the action of 1 % of papain for two days was only slightly affected by either

sample, probably owing to the age and hardness of the fibrin used. *Cooked Fibrin* was subjected to the action of 1 % of papain for thirty hours. *A.* had dissolved 60 times its weight; *B.* only 20 times its weight of cooked meat. Under similar conditions *A.* dissolved 200 times its weight of hard-boiled egg albumen; *B.* only 62 times its weight. 100 cc. of milk were digested with 0.1 gram of the papain. In about 3 minutes, in the case of *A.*, a curd had formed which immediately commenced to dissolve, and in twenty-four hours most of it had disappeared. In the case of *B.* no curd had formed in 7 hours, but was observed 12 hours later, without, however, showing any signs of solution in the same time, during which nearly all of the curd produced by *A.* had dissolved.—*Phar. Jour. and Trans.*, July 1885, 45-46.

Papain—Action, etc.—In a previous paper ('*Journ. of Physiology*,' vol. v, No. 4) Mr. Sidney H. C. Martin had detailed the characters and action on coagulated albumen of the proteolytic ferment obtained from the papaw juice (*Carica Papaya*). In the material used he had found two proteids, a globulin and a "peptone;" and he was unable to arrive at any conclusion as to which of these bodies was the ferment. The author has since extended his experiments with a view to settling this point. In the first place, the body called a "peptone" in his previous paper is not a true peptone—that is, a proteid capable of fairly rapid diffusion, not precipitated by nitric nor acetic acid and ferrocyanide of potassium; but it is one of the bodies intermediate between globulins and peptone, first described by Meissner as a peptone, and called by Kuhne *hemialbumose*. This body agrees with peptone in the following reactions: It is soluble in distilled water, and is not precipitated from its solution by boiling; it also gives a pink or red color with copper sulphate and excess of potash. It differs from peptone in being precipitated by strong mineral acids, and by acetic acid and ferrocyanide of potassium. These reactions agree with those given by Wurtz as characteristic of solutions of pure papain, which agreement led the author to think that the ferment was associated with hemialbumose. This he found to be the case. A glycerin extract was made of commercial papain and filtered under pressure. This extract contained a proteid (hemialbumose) in quantity, and a mere trace of globulin. It was as active as the powder itself. Part of this extract was diluted with water, and saturated with magnesium sulphate to precipitate the small amount of globulin which was filtered off; the filtrate was then saturated with sodium sulphate, which precipitated the hemialbumose. This was collected on a filter, washed with saturated solution of sodio-magnesium sulphate, and then dissolved in water. This solution was found to be very active; it was tested with coagulated egg-albumen, peptones being formed in quantity. The filtrate, after saturation with sodium sulphate, contained a little hemialbumose. After dialyzing for some hours, its action was tested on egg-albumen; very little,

if any, was digested. This experiment shows distinctly that the ferment action is associated with the hemialbumose. Whether the ferment may be separated from the hemialbumose the author is, at present, unable to state. Ptyalin (Conheim) and pepsin (Brücke) have been separated from proteid. Trypsin, however, has not, though Schützenberger states that probably all diastatic and proteolytic ferments may be separated from the accompanying proteids. The author has repeated the experiments on animal albumen detailed in his first paper, and can only confirm what he has there stated, namely, that papain acts like trypsin (though not so rapidly) in forming from coagulated albumen and fibrin a true peptone, an intermediate body related to globulin, and leucin, and tyrosin.

The author, furthermore, studied the action of papain upon milk. He finds it to act like pancreatic juice on milk, first curdling it, and within certain limits of temperature the curds are more quickly formed and are larger the higher the temperature up to 62° C., at which point the curdling is practically instantaneous. The curdling is hindered by making the milk alkaline with bicarbonate of sodium, by diluting it, and also, to some extent, by boiling the milk previous to the addition of an equal quantity of cold water. The curds in "papainized" milk gradually dissolve, the casein being changed into peptones, leucin and tyrosin being produced, and the liquid becoming bitter to the taste. An intermediate body is also formed, which on experiment proved to be hemialbumose. As the result of his experiments the author makes the following practical suggestion regarding the preparation of

Papainized Milk.—A pint of milk is taken and a quarter of a pint of water, add an equal volume of milk to the water, and 30 grains of bicarbonate of sodium, and boil; add the remaining milk to the hot liquid. The resulting temperature varies from 45° to 55° C.; it is usually about 48° C. The papain must now be quickly stirred in, the mixture covered, and put in a warm place. After digestion it is boiled to stop the reaction. The method answers equally well for pancreatic digestion, and obviates the use of a thermometer. For preparing partly digested milk, seven grains of papain, with an hour and a half's digestion, is quite sufficient for a pint of milk; for the more complete digestion, 10 grains for two hours must be used.—Phar. Jour. and Trans., Aug. 8, 1885, 129-130.

Papayotin—Uses and Value in Diphtheria.—Prof. A. Jacobi states that he had used "papayotin" some years ago in the treatment of diphtheria, at first with moderate success, but was compelled to abandon it in consequence of its apparent variability. In fact, he states that certain unsatisfactory samples or lots were found to consist, "under the legitimate rules of modern tradesmen and manufacturers, of milk sugar." Recently, however, he began to use the substance again, having probably received

it from a more reliable source, and he finds it to be a most efficient agent, if properly used. He employs a solution containing

Papayotin	1 part.
Glycerin	4 parts.
Water	4 parts.

which is to be applied hourly to the diphtheritic membrane. In one case where tracheotomy had been performed, and the development of the pseudo-membrane progressed downwards into the trachea and bronchi, the solution was applied by means of a feather from a live pigeon's wing, which was dipped in the solution and, being introduced through the rubber tube in the trachea, was pushed down and turned around several times, so as to leave as much of the solution as possible in contact with the false membrane. After a few hours, shreds of the latter were coughed up. The treatment was continued through some days. More membranes came; gradually they became softer and macerated, and finally the secretion became muco-purulent and mucous. Before the end of the second week the tube was removed.

Physicians who wish to use papayotin should know that there are two kinds sold by manufacturers. One is the *pure* ferment; and the other is a dilution containing only 25% of pure papayotin, the remainder being generally milk sugar. To judge from the price-lists of European manufacturers of chemicals, some of them prepare only the 25% dilution, which, if labeled merely "papayotin," is liable to disappoint those wishing to try the article in diphtheria.—*Amer. Drugg.*, April 1886, 65-66.

Peptone—Properties and Preparation.—According to an authority in "*Schweiz. Wochenschr.*" (xxiii, 381), peptone is advantageously made as follows: 5 kilograms of finely chopped lean beef are placed in a porcelain evaporating dish with 5 kilograms of water, 150 grams C. P. concentrated hydrochloric acid, and 20 grams (Witte's) pepsin; allowed to stand at ordinary temperature for one day, stirring frequently; it is then heated in a water-bath, taking care not to heat the mixture to more than 70° C., for one day. The excess of acid is neutralized by sodium carbonate (requiring about 150-160 grams). The resulting turbid solution is brought up to 10 kilograms, 5 kilograms of concentrated alcohol added, and then put aside for one day to settle. The precipitate is collected on a strainer, expressed, and the liquid filtered. After recovering the alcohol, the solution is evaporated to extract consistency, poured on plates and dried. Peptone prepared thus is in brown pieces, quite brittle, yielding, when pulverized, a yellowish-brown powder, soluble in at least 2 parts of water. Yield is about 4-6 per cent. of the meat used.

Properties: 1. Peptone should be soluble in two parts of water; the solution is not gelatinous, and becomes turbid on adding 5 volumes of absolute alcohol; the addition of more water makes a clear solution.

2. A 10 per cent. solution does not become turbid either at an ordinary or elevated temperature on adding nitric acid, acetic acid, ferrocyanide of potassium or saturated solution of sodium sulphate.

3. Picric acid produces yellow—tannic acid, ash-gray flakes.

4. Sulphate of copper and caustic potash produce a violet coloration.

5. It should yield not more than 2 per cent. of ash when incinerated.

6. If to 20 drops of a 1 per cent. solution of peptone 5 drops of a 10 per cent. solution of calcium bichromate are added, no turbidity is produced; if the mixture becomes turbid it proves the presence of at least 5 per cent. of glutinous matter. Solution of bichromate of calcium (Freire's test) is made by dissolving 5 grams crystallized chromic acid in 25 grams of water, gradually adding 2 grams pure calcium carbonate; after effervescence the solution is diluted to 60 cc. and filtered through glass-wool. Owing to the rapidity with which peptone is decomposed, it is not advisable to keep it in liquid form.—*Amer. Jour. Pharm.*, Jan. 1886, 16.

Peptone Soup—Preparation.—Dr. W. Jaworski gives the following directions for preparing a peptone soup which is readily taken by most patients without further seasoning. Others require seasoning, for which directions are given below.

Procure each day a suitable piece of beef (best from the back) or of veal (from quarter) free from bone, sinew or fat, and scrape it with a blunt knife until one pound has been scraped off. It takes at least two pounds of butcher's meat to obtain that quantity. Place the scraped meat into a pot (not made of metal, or at least perfectly lined), then pour on 1 quart of soft water, and mix with a wooden spoon. Next add, constantly stirring, $1\frac{1}{2}$ fluidounces of diluted hydrochloric acid, and afterwards 8 grains of "*Pepsinum Germanicum solubile*." Mix intimately, place the pot over night on a warm stove or other suitable apparatus [it should not feel *hot* to the hand], and see that it is occasionally stirred up. Next morning boil the contents at a moderate heat, frequently stirring, until they have become a homogeneous pulp, which will require one or two hours. Then remove any fat that may float on top, and strain through a sieve or colander, to free the pulp from any remaining fibres or undissolved pieces, diluting the mass, for this purpose, with boiling water, if necessary. Finally add enough of a ten-per-cent solution of carbonate of sodium, until the acid taste has been *nearly all* removed.

If seasoning is desired, the author recommends to roast 1 or 2 spoonfuls of flour with a little fresh butter, and to add this to the soup; or he directs 4 oz. of the juice of roast beef (free from fat) to be added. In some cases, the addition of sugar, or wine, or rum, or cognac, will make it more palatable. It tastes best when it has a faintly acid taste and is eaten warm.

A quantity of soup prepared from 1 pound of meat is usually sufficient for the daily use of one patient. In summer, it must be prepared fresh every day. In the cooler season, a somewhat larger quantity may be made, and this may be prevented from spoiling too rapidly by the addition of about 8 grains of salicylic acid per pound of meat.—*Amer. Drugg.*, Oct. 1885, 186; from *Deutsch. Medic. Zeit.*, July 20th.

Commercial Pancreatin—Determination of Diastatic Value.—Mr. H. W. Snow communicates the results of an examination respecting the diastatic value of commercial samples of pancreatin—so-called, using the following method: A solution of starch containing 1 per cent. is employed. 10 cc. of this are diluted with 100 cc. of distilled water. This is added to 1 cc. of solution of the pancreatin (obtained by digesting 1 gram in 100 grams of water and allowing the mixture to stand for several hours), in definite quantities, and digested five minutes at a temperature of 40° C., after which a drop of dilute iodine solution is added. The experiment is repeated with a larger quantity of the starch solution in absence of a reaction with the iodine solution, or with a smaller quantity if iodine gives a reaction, and in this way the exact power of starch conversion is finally determined. The results of the author's examination show a wide difference in the saccharifying power of the different pancreatines examined. As to the

Emulsifying Power of Pancreatin, none of the samples were capable of producing an emulsion in the true sense. The best results were obtained with acid solutions of the pancreatin.—*Western Drugg.*, May, 1886, 139-141.

Diastase—Wide Distribution in Nature.—According to Mr. E. Bourquelot, diastase is widely distributed in nature, both in animals and plants. Most physiologists admit that malt diastase and that of human saliva determine the saccharification of starch, of glycogen, and of certain dextrans; but some maintain that these compounds possess other properties. The author, however, shows that the inversion of cane-sugar ascribed to the action of saliva diastase is really due to the invertin secreted by microphytes present in the saliva; the same action caused by malt diastase is due to invertin secreted by fungoid growths which can be found on the malt grains. The author maintains that all the diastases considered are identical.—*Jour. Chem. Soc.*, 1885, p. 927; from *Jour. de Pharm.* (5) xi, 367-372.

Diastatic Ferment—Occurrence in the Bean.—Messrs. Stingl and Morawski confirm the presence in the bean of a very active diastatic ferment, which places it in respect of saccharifying power beyond any other fruit at present known. This ferment converts about two-thirds the starch upon which it acts into sugar and one-third into dextrin, resembling in this respect the action of the diastatic ferment of unmalted barley. It,

however, differs from that of malt, which forms more dextrin and less sugar, the smaller the quantity of malt in proportion to the starch upon which it acts. The bean itself contains only a small quantity of dextrin, the extractive being a mixture of different sugars (about 12 per cent.), distinguished by their easy fermentibility. The authors consider that the small amount of starch in the soja bean, and the minuteness of the granules, are explained by the presence of the energetic diastatic ferment.—Pharm. Jour. and Trans., June 26, 1886, 1085; Monatshefte f. Chem., April, 1886, 176.

Diastatic Ferment.—*Occurrence in Gums*, which see.

Diastase—Production by the Activity of Bacteria.—Some time ago Mr. Jorisson made the statement that diastase is the product of the activity of bacteria. Mr. Laurent has now made some experiments which appear to show at least that this is not necessarily the case. He found that grains of maize, barley, etc., freed from micro-organisms by sterilization, germinated under a bell-glass with previously boiled water. As soon as the rootlets were perceptible, the grains were removed with suitable precautions to tubes containing Koch's nutritive gelatin. As the germination progressed normally, without any liquefaction of the gelatin taking place, Mr. Laurent considers the absence of bacteria to have been demonstrated, and therefore holds the formation of diastase or other soluble ferments to be a phenomenon closely connected with the protoplasm of plants.—Phar. Jour. and Trans., Oct. 31, 1885, 369; Mon. Belge, 1885, 289.

Diastase—Estimation in Malt Extracts, which see under "Pharmacy."

Diastatic Ferments—Action upon Blood.—According to Professor Salvioli the action of vegetable diastase and of the diastatic rennet ferment on the circulating blood is to abolish the property of coagulability, so that a sample of blood taken will frequently remain liquid for an hour and a half. The diastatic ferments are also said to lower the blood pressure. Ptyalin prepared according to Willich's method is similar in action, but weaker. It appears, therefore, that these organisms produce modifications both of the plasma and the morphological elements, which impede the combination of the fibrin-forming constituents.—Phar. Jour. and Trans., Feb. 27, 1886, 724; Chem. Ztg., Jan. 31, 1886, 23.

Gum Ferment.—A peculiar diastatic ferment to which is attributable the formation of *Gum* in plants. See under "*Carbohydrates*."

A Ferment-like body in Rhubarb root, which see under "*Materia Medica*."

Jequeritin—Jequerityzyme.—The active constituents of *Jequerity*, which see under "*Materia Medica*."

Milk—Investigation of Albuminoids.—Mr. A. Dogiel has made some comprehensive investigations of the albuminoids of milk, which he has

communicated to "Zeitschr. physiol. Chem." (ix, 591), and which are given in abstract in "Jour. Chem. Soc." (1885, 1149), as follows:

1. *Peptones*.—As a result of his investigation of cow's milk, Schmidt-Mülheim states that it contains peptones, the proportion varying from 0.08 to 0.19 per cent. of the milk ("Pflüger's Archiv," 28, 287). Hofmeister, on the other hand, denies that they are present, and in human milk likewise ("Zeit. physiol. Chem.," 2, 288). In further investigating this question, the author sought first to ascertain the probable error inherent in the method of isolating the peptones. For this purpose known quantities of peptones were added, and the milk was then treated with ferric chloride solution in the usual way for the separation of other proteïds; the peptones were estimated in the filtrate by means of a comparative colorimetric determination based on the biuret reaction. In 19 experiments in which 40 cc. of milk were taken for each, the quantities of peptones added varied from 0.004 to 0.020 gram, and the solutions finally obtained, after precipitation and washing, amounted to 190–250 cc. The ultimate result was to show that the quantity of peptone retained by the precipitate was independent of the amount added, the quantity lost being approximately 0.005 in each experiment, that is, 0.0023 for every 100 cc. solution ultimately obtained. That the peptone is retained by the precipitate is proved, according to the author, by the diminished loss which is noted when the iron oxide precipitate is boiled with water, and this aqueous extract added to the solution. By varying the quantity of milk, it was found that the loss of peptone remained equally uninfluenced.

On the basis of the experience of these blank experiments, the author proceeded to the examination of normal specimens of cow's and woman's milk, adopting special precautions in the isolation by precipitation of the peptones presumed to be present. In all cases, however, negative results were obtained. Having further repeated Schmidt-Mülheim's experiments (*loc. cit.*), and found that the substance supposed by him to be a peptone is a residue merely of one of the normal proteïds of milk, the author finally concludes that these milks do not contain peptones.

2. *Caseïns*.—The author has isolated, with special precautions, the caseïns from woman's and from cow's milk for the purpose of instituting a comparison of their properties. Having found that their reactions were substantially identical, he examined the products of their artificial (peptic) digestion, which proved to be identical also, and there can be no doubt therefore, that they are, chemically, very closely related.

3. *Other Proteïds*.—In a comparative examination of the products of peptic digestion of the two milks, by the optical method, the author found the rotation to be 50 per cent. greater in the case of the products from woman's milk, whence he concludes that in regard to the proteïds, not peptones, the two milks are differently composed. He suggests that

the difference may be chiefly in respect of the lacto-albuminoid recently described by Sebelein.

Milk—Decomposition and Fermentation.—Dr. F. Haeppe, as the result of patient attention to the subject of the decomposition and fermentation of milk, describes five distinct organisms which he finds to be invariable accompaniments of lactic fermentation. One of these he isolated on nutrient gelatin in the form of white, shining, flat, minute beads. This organism has the power of transforming milk sugar and other saccharoses into lactic acid, with evolution of carbonic acid. It is rarely found in the saliva or mucilage of the teeth. In these are two micrococci, both of which cause the production of lactic acid, but which manifest differences in their development under cultivation. There are also two pigment-forming bacteria; *Micrococcus prodigiosus*, which produce intensely red spots, and the yellow micrococcus of osteomyelitis. These five bacteria are so different and so constant in their properties that they must, in the author's opinion, be regarded as distinct species. In addition to these there is in milk an organism resembling *Mycoderma aceti*, which transforms milk sugar into gluconic acid.—Pharm. Jour. and Trans., Jan. 9, 1886, 590.

Milk Analysis—Objection to Certain Modifications.—Mr. J. A. Wanklyn protests against certain modifications that have been introduced recently into the process of milk analysis. He says that in constructing his system of milk analysis he was mindful that milk is a complex fluid, the constituents of which must be fragile, and that in submitting it to analytical processes there was danger of decomposition. In obtaining the total milk solids by evaporation of the water and drying the residue it was necessary to guard against confounding water actually contained in the milk with water that might be a product of decomposition. He therefore sought the quickest way of obtaining the "total solids," and is still of opinion that a three hours' exposure to 100°C. in a suitable platinum dish will deprive 5 grams of milk of all its water and reduce it to the condition of dry milk solids. Some analysis have altered the time of drying, and others take 10 grams instead of 5 grams, whilst the temperature of drying has also been altered, being in some cases raised to 110°C.; but the author disapproves of all these alterations and maintains that under such treatment discrepancies are inevitable. He insists also upon the better results obtained by the indirect determination of the "solids not fat" by the arithmetical operation of subtracting the quantity of "fat" from the quantity of "total solids," in preference to the direct operation of weighing the "solids not fat." With respect to the determination of the "fat," he sees no reason to alter the method originally laid down by him (see Proceedings 1874, 285), and he says that he suspects that the extra 0.2 per cent. credited to the use of a Soxhlet apparatus may be due to a product arising from the decomposition of casein.

By his method milk analysis can be completed satisfactorily in three and one-half hours.—Pharm. Jour. and Trans., Feb. 27, 1886, 721; Ch. News, Feb. 5, 1886, 70.

Milk—Simple and Accurate Method of Determining Quality.—Mr. Wm. W. Bartlet, in reply to a query, gives the following simple directions respecting the examination of milk. Its sp. gr. may range between 1.029 and 1.033 at 60° F.; it should have a very slight acid reaction—if alkaline, this is due to addition of alkali. The cream is determined by reading off its volume in a 100 cc. tube at the end of 24 hours. The total solids are determined by evaporating five grams of the milk, mixed with pure white sand, in a shallow porcelain capsule, or, better, a flat-bottomed platinum capsule (without sand), until apparently dry, at 212° F., this requiring usually about an hour and a half. The fat is determined by extracting the residue with petroleum benzin until the latter no longer takes up any, and again drying the residue and weighing. The loss in weight is the fat. The percentage of ash is determined by igniting the residue in the platinum capsule and weighing—the amount of water by subtracting the weight of the total solids found, from the weight of the sample of milk employed, 87% being the amount allowed by the law of the State of Massachusetts.—Proc. Mass. State Pharm. Assoc., 1886, 148–152.

Milk Tester—A Practical Apparatus.—Mr. Joseph W. England draws attention to Heeren's Milk Tester. The principle upon which this "tester" seems to rest is apparently dependent upon the action of the light rays in traversing through the flattened sample of the milk upon a central disk of vulcanite, which encounter a resistance in their passage through the film of liquid proportionate to its opacity, so that when a relatively thick liquid like "cream" is taken for inspection, the light rays are almost wholly intercepted in their passage, and the color afforded by the test is almost white.

Then, reversely, "very poor milk" affords almost black color, or rather, a deep bluish-black, from the relative ease with which the light rays penetrate to the black disk; the intermediate grades, which vary between "cream" as the highest, and "very poor milk" as the lowest, being known as "very fat milk," "normal," "less fat," and "poor," according as they are light slate, slate, light blue, and blue in color.

For the purpose of ready comparison, the series of the six colors, with the names of each grade attached, are arranged, concentrically, around the central, transparent circle of the glass disk of the glass plate, and any variation in color from the standard is thereby quickly detected.—Amer. Jour. Pharm., Feb. 1886, 83–84.

Milk—Action of Rennet.—Mr. W. Eugling has studied the character of casein in milk, which he believes to exist in form of a definite organic

compound with calcium. When milk is boiled, a part of the phosphates dissolved by the alkaline phosphates of the serum passes by the action of heat out of the serum and combines with the casein compounds, the result being the formation of an alkaline albuminate; consequently the milk has an alkaline reaction. This statement is supported by the results of the analysis of milk (fresh and boiled) after addition of alcohol, which separates casein, combined with a larger quantity of calcium if the milk has been boiled than when it is fresh. It is because of this rearrangement of the constituents of milk after boiling, that it becomes alkaline, and that rennet has no action on boiled milk; but if an acid be added so as to bring back the original condition by destroying the alkaline albuminate, the rennet produces its well-known effects. It is possible that the action of rennet is to hydrolize a part of the milk albuminates, whereby its combinations with calcium phosphates are rendered less stable; in proof of this, it is stated that although calcium is not recognizable by means of ammonium oxalate in the serum produced by the addition of alcohol or sodium chloride, yet it is immediately precipitated in the serum from rennet, and as this serum has an acid reaction, it follows that an albuminate has been formed which holds the calcium phosphate in solution as an acid albuminate. Soxhlet considers that the separation of casein is accompanied by the formation of lactic acid; the author has been enabled to detect this acid in the whey, but he has found several albuminoids, and prefers to consider the formation of acid albuminates by hydration as most probable.

If milk contains lactic acid (1 per 1000), the action of the rennet is more rapid, but the casein produced contains a smaller percentage of ash than it should normally, and is of a bitter taste; if the quantity of acid is more than $1\frac{1}{2}$ per 1000, then the cheese is uneatable. In a cheese prepared under normal conditions, there is present 8.25–8.75 calcium compounds, which are present in the proportion of 1 mol. tricalcium to 1 mol. monohydrocalcium phosphate. Sometimes part of the calcium is replaced by magnesium.—*Amer. Jour. Pharm.*, Jan. 1886, 42–43; from *Jour. Chem. Soc.*, 1885, p. 1083; *Land. Vers.-Stat.*, 1885, p. 392.

Kefir—Preparation.—According to Dr. Rogelmann, kefir is readily obtained by mixing one volume of buttermilk with two volumes of sweet milk, pouring into a bottle and allowing to stand. In three hours active fermentation will set in, which in about three days will be at an end. The product is a fluid smelling like wine, and containing alcohol, carbonic acid, lactic acid, and caseine. The following precautions are to be observed in this in every way simple and inexpensive procedure. The sweet milk used ought not to be wholly freed from the cream, and the bottles ought to be of a size that the milk fills only two-thirds of them. The fermenting milk is to be shaken daily vigorously (about three or four times), during which manipulation a cork is placed firmly in the bottle,

but removed after the shaking, in order to allow the carbonic acid to escape. The opened bottle is to be placed in a horizontal position at least twice daily for a period of ten minutes, in order to let fresh air take the place of carbonic acid, and thus to prevent the stoppage of fermentation. If a very effervescent liquid be desired, the bottles are toward the close of the fermentation process allowed to stand continuously in a perpendicular position. In order to obtain new quantities of this milk wine a certain quantity of sweet milk is mixed with one-fifth of its volume of the fermented milk, in this way continuing the production *ad libitum*. The most favorable temperature for the preparation of this milk-wine is 15° C. (59° F.)—Amer. Drugg., April 1886, 65; from Deutsche Med. Ztg., Jan. 14, 1886.

Casein—Estimation in Milk.—Frenzel and Weil recommend diluted sulphuric acid in place of acetic for precipitation. In a beaker glass of 150 cc. capacity, place 60 cc. distilled water, add 20 cc. of well-shaken milk by means of a pipette, and stir well. Then add 30 cc. dilute sulphuric acid (1:1000), put in a cool place for several hours, pass the supernatant liquid through a weighed filter, collect the precipitate upon the same filter, wash twice with water, and afterwards successively with 90 per cent. alcohol, absolute alcohol, and ether. Dry at 110° C. to a constant weight, then incinerate and subtract the weight of the ash from the weight of the precipitated casein.—Amer. Jour. Pharm., Sept. 1885, 436; from Ztsch. f. Physiol. Chem., 1885.

Cheese—Digestibility of Varieties—Mr. Klenze has experimented upon the digestibility of eighteen varieties of cheese. Cheddar was digested in the shortest time (four hours), whilst unripe skim Swiss cheese required ten hours for solution. There is no difference in the digestibility of all sorts of hard cheese, or all soft cheese, but all fat cheeses are dissolved the most rapidly, because being open by reason of the fat they are the more readily attacked by the solvent. There is no connection between digestibility and the percentage of water present in the cheese, but there is some connection with the percentage of fat and the degree of ripeness. From examination of the quantity of nitrogen dissolved, the author concludes that, on account of its great digestibility, cheese is the most nourishing of all food, meat and eggs excepted.—Phar. Jour. and Trans., Dec. 19, 1885, 522; Jour. Chem. Soc., Dec. 1885; Bied. Centr., 1885, 564-568.

LIST OF MEMBERS AND DELEGATES IN ATTENDANCE AT THE THIRTY-FOURTH ANNUAL MEETING.

Names of Delegates are indicated by an asterisk (*).

*M. Abernethy, Jersey City, N. J.
 *W. Ahern, Montreal, Quebec, Can.
 *M. W. Alexander, St. Louis, Mo.
 H. J. Alfreds, Providence, R. I.
 *J. H. Andrews, Seymour, Ind.
 H. W. Atwood, New York, N. Y.
 *T. R. Baker, Richmond, Va.
 *L. R. Baridon, Montreal, Quebec, Can.
 G. C. Bartells, Camp Point, Ill.
 *W. W. Bartlet, Boston, Mass.
 P. W. Bedford, New York, N. Y.
 *S. J. Bendiner, New York, N. Y.
 G. W. Berrian, North Andover, Mass.
 J. E. Blake, New Bedford, Mass.
 W. B. Blanding, Providence, R. I.
 E. Bocking, Wheeling, W. Va.
 E. C. Boyden, Boston, Mass.
 E. W. Brant, Elizabeth, N. J.
 P. H. Bruck, Columbus, O.
 J. Buck, Chelsea, Mass.
 W. Bush, Worcester, Mass.
 *F. H. Butler, Lowell, Mass.
 A. H. Caffee, Carthage, Mo.
 A. L. Calder, Providence, R. I.
 *E. A. Calder, Providence, R. I.
 P. C. Candidus, Mobile, Ala.
 *Henry Canning, Boston, Mass.
 Solomon Carter, Boston, Mass.
 W. A. Chapin, Boston, Mass.
 *W. B. Cheney, South Manchester, Conn.
 J. Choate, Fitchburg, Mass.
 G. C. Close, Brooklyn, N. Y.
 V. Coblentz, Springfield, O.
 *J. W. Colcord, Lynn, Mass.
 A. B. Collins, Westerly, R. I.
 *G. S. Cook, Somerville, N. J.
 *E. A. Cornell, Williamsport, Pa.
 W. H. Cotton, Newport, R. I.
 *D. M. R. Culbreth, Baltimore, Md.
 *E. C. Danforth, Providence, R. I.
 B. F. Davenport, Boston, Mass.
 *C. W. Day, Springfield, Ill.
 *W. P. De Forest, Brooklyn, N. Y.

*C. L. Diehl, Louisville, Ky.
 E. T. Dobbins, Philadelphia, Pa.
 *A. S. Dolloff, Lake Village, N. H.
 G. E. Dresser, Putnam, Conn.
 L. A. Drown, Taunton, Mass.
 L. D. Drury, Boston, Mass.
 *W. C. Durkee, Boston, Mass.
 *A. E. Ebert, Chicago, Ill.
 *R. G. Eccles, Brooklyn, N. Y.
 Leo Eliel, South Bend, Ind.
 *H. A. Elliott, Baltimore, Md.
 J. J. Estes, Rockland, Mass.
 J. S. Evans, West Chester, Pa.
 *H. W. Fuller, New York, N. Y.
 E. A. Gessner, New Haven, Conn.
 J. G. Godding, Boston, Mass.
 Thos. F. Goodale, Boston, Mass.
 Wm. R. Greene, Providence, R. I.
 *T. L. A. Greve, Cincinnati, O.
 *L. A. Haber, Cleveland, O.
 *C. E. Hall, Greenville, N. H.
 *C. S. Hallberg, Chicago, Ill.
 F. L. Harwood, Warren, Mass.
 *B. F. Hays, New York, N. Y.
 D. Hays, New York, N. Y.
 *C. A. Heinitch, Lancaster, Pa.
 F. W. Herbst, Columbus, O.
 F. Hoffmann, New York, N. Y.
 A. H. Hollister, Madison, Wis.
 *C. W. Holmes, Elmira, N. Y.
 Chas. Holzhauer, Newark, N. J.
 J. T. Hoskinson, Jr., Philadelphia, Pa.
 *G. M. Hoyt, Boston, Mass.
 *John Ingalls, Macon, Ga.
 L. L. Jenkins, Boston, Mass.
 C. B. Johnson, Middletown, O.
 *E. C. Jones, Philadelphia, Pa.
 G. B. Kauffman, Columbus, O.
 G. W. Kennedy, Pottsville, Pa.
 E. F. Kessler, Louisville, Ky.
 M. N. Kline, Philadelphia, Pa.
 F. F. Knapp, New York, N. Y.
 *N. A. Kuhn, Omaha, Neb.

- *S. Lachance, Montreal, Quebec, Can.
 *E. W. Lancaster, Marshall, Tex.
 H. I. Leith, Providence, R. I.
 J. I. Lemberger, Lebanon, Pa.
 *H. F. Libby, Pittsfield, Me.
 *J. U. Lloyd, Cincinnati, O.
 *G. B. Lockhart, Washington, D. C.
 *T. J. Macmahan, New York, N. Y.
 *T. F. Main, New York, N. Y.
 *H. C. C. Maisch, Philadelphia, Pa.
 J. M. Maisch, Philadelphia, Pa.
 *G. F. H. Markoe, Boston, Mass.
 E. C. Marshall, Charlestown, Mass.
 *F. H. Masi, Norfolk, Va.
 *A. H. Mason, Montreal, Quebec, Can.
 N. N. Mason, Providence, R. I.
 *J. O. May, Naugatuck, Conn.
 G. McDonald, Kalamazoo, Mich.
 T. D. McElhenie, Brooklyn, N. Y.
 *E. McIntyre, New York, N. Y.
 *R. McLeod, Quebec, Can.
 *H. J. Menninger, Brooklyn, N. Y.
 J. A. Meyers, Columbia, Pa.
 *J. A. Milburn, Washington, D. C.
 *A. W. Miller, Philadelphia, Pa.
 J. A. Miller, Gloversville, N. Y.
 *J. C. Munds, Statesville, N. C.
 L. I. Munson, Waterbury, Conn.
 T. B. Nichols, Salem, Mass.
 *L. E. Nicot, Brooklyn, N. Y.
 J. S. Orne, Cambridgeport, Mass.
 *H. H. Osgood, Norwich, Conn.
 C. Z. Otis, Binghampton, N. Y.
 *E. Painter, New York, N. Y.
 G. H. Parker, Andover, Mass.
 J. H. Parker, Meriden, Conn.
 *C. W. Parsons, New York, N. Y.
 E. E. Parsons, Orange, N. J.
 *E. L. Patch, Boston, Mass.
 *John E. Patten, Rhode Island.
 *J. F. Patton, York, Pa.
 *R. D. Peyton, Ky.
 *F. J. Phillips, Rhode Island.
 F. O. Pilsbury, Walpole, Mass.
 H. C. Porter, Towanda, Pa.
 E. Post, Athens, N. Y.
 B. F. Quackinbush, New York, N. Y.
 *H. H. Rademaker, Louisville, Ky.
 G. D. Randall, St. Johnsbury, Vt.
 *J. H. Redsecker, Lebanon, Pa.
 Paul Reinlein, Washington, D. C.
 Wm. K. Reynolds, Providence, R. I.
 J. P. Remington, Philadelphia, Pa.
 *C. Rice, New York, N. Y.
 *A. Robbins, Philadelphia, Pa.
 *Joseph Roberts, Baltimore, Md.
 *W. Rogers, Louisville, Ky.
 *W. H. Rogers, Middletown, N. Y.
 William Rust, New Brunswick, N. J.
 *C. A. Santos, Norfolk, Va.
 *William Saunders, London, Ontario, Can.
 *E. A. Sayre, Newark, N. J.
 *H. Schmidt, New York, N. Y.
 G. J. Seabury, New York, N. Y.
 N. D. Sevin, Norwich, Conn.
 D. J. Sewell, Boston, Mass.
 *S. A. D. Sheppard, Boston, Mass.
 I. H. Shurtleff, New Bedford, Mass.
 *W. Simon, Baltimore, Md.
 *Karl Simmon, St. Paul, Minn.
 Geo. Slosson, Coffeyville, Kan.
 E. N. Smith, Thompsonville, Conn.
 W. A. Spalding, New Haven, Conn.
 *C. B. Spofford, Claremont, N. H.
 B. F. Stacey, Charlestown, Mass.
 *J. H. Stein, Reading, Pa.
 *L. F. Stevens, Brooklyn, N. Y.
 J. H. Taylor, Newport, R. I.
 *J. W. Thomas, Jr., Norfolk, Va.
 *W. S. Thompson, Washington, D. C.
 F. M. Tiernan, Roselle, N. J.
 A. M. Todd, Nottawa, Mich.
 *J. W. Tomfohrde, St. Louis, Mo.
 *H. Trimble, Philadelphia, Pa.
 *C. A. Tufts, Dover, N. H.
 *Rosa Upson, Marshalltown, Ia.
 R. H. Vansant, Trenton, N. J.
 *E. O. Vars, Allegany co., N. Y.
 William R. Warner, Philadelphia, Pa.
 J. LeRoy Webber, Detroit, Mich.
 O. C. Weinman, New York, N. Y.
 H. S. Wellcome, London, England.
 *A. W. Wellington, Rhode Island.
 *J. D. Wells, Cincinnati, O.
 F. T. Whiting, Great Barrington, Mass.
 H. M. Whitney, Lawrence, Mass.
 F. Wilcox, Waterbury, Conn.
 G. R. Wiley, Bethel, Me.
 B. O. Wilson, Boston, Mass.
 F. M. Wilson, Willimantic, Conn.
 N. Wolf, Wilkesbarre, Pa.
 M. B. Wood, Providence, R. I.

LIST OF COLLEGES AND ASSOCIATIONS.

HAVING ACCREDITED DELEGATES TO THE THIRTY-FOURTH ANNUAL MEETING, WITH
THE ADDRESSES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

<i>Colleges.</i>	<i>Presidents.</i>	<i>Secretaries.</i>
Chicago	Judson S. Jacobus	Fred. M. Schmidt.
Cincinnati	George W. Voss	Chas. T. P. Fennell.
Louisville	E. Scheffer	Fred. C. Miller.
Maryland (Baltimore).	Jos. Roberts	John W. Geiger.
Massachusetts (Boston).	Henry Canning	Chas. C. Williams.
Montreal	Louis R. Baridon	Wm. Ahern.
National (Washington).	Chas. Becker	R. L. Eliot.
New York	Ewen McIntyre	J. N. Hegeman.
Ontario (Toronto)	Edmund Harvey, Guelph.	Geo. Hodgetts.
Philadelphia	Chas. Bullock	Wm. B. Thompson.
Pittsburgh.	George A. Kelly	James B. Cherry.
St. Louis	J. C. Kirkbride	Wm. C. Bolm.

STATE PHARMACEUTICAL ASSOCIATIONS.

	<i>Presidents.</i>	<i>Secretaries.</i>
Alabama	A. L. Stollenwerck, Birmingham.	P. C. Candidus, Mobile.
California	W. M. Searby, San Francisco .	Chas. Troppmann, San Francisco.
Connecticut	F. M. Wilson, Willimantic . .	Frederic Wilcox, Waterbury.
Georgia	J. W. Stanford, Cuthbert . . .	H. R. Slack, Jr., La Grange.
Illinois	B. F. Gardner, Atlanta	L. C. Hogan, Englewood.
Indiana	Leo Eliel, South Bend	Frank S. Hereth, Indianapolis.
Iowa	A. H. Miles, Des Moines	Rosa Upson, Marshalltown.
Kansas	W. C. Sears, Burlington	John T. Moore, Lawrence.
Kentucky	J. W. Fowler, Louisville	W. B. McRoberts, Stanford.
Maryland	A. J. Corning, Baltimore	M. L. Beyers, Hagerstown.
Massachusetts	H. Canning, Boston	J. W. Colcord, Lynn.
Michigan	H. J. Brown, Ann Arbor	S. E. Parkill, Owosso.
Minnesota	J. R. Jones, Mankato	E. F. Allen, Minneapolis.
Missouri	A. H. Caffee, Carthage	G. H. C. Klie, St. Louis.
Nebraska	James Reed, Nebraska City . . .	Chas. J. Daubach, Omaha.
New Hampshire	N. S. Whitman, Nashua.	C. B. Spofford, Claremont.
New Jersey	F. B. Kilmer, New Brunswick .	R. H. Vansant, Trenton.
New York	Clark Z. Otis, Binghamton. . .	Clay W. Holmes, Elmira.
North Carolina.	A. W. Rowland, Wilson	J. C. Munds.
Ohio	Virgil Coblentz, Springfield . .	Lewis C. Hopp, Cleveland.
Pennsylvania	James A. Meyers, Columbia . .	J. A. Miller, Harrisburg.
Rhode Island	Wm. K. Reynolds, Providence.	

Texas	G. H. Rice, Baudera	W. L. Tucker, Waco.
Virginia.	Hugh Blair, Richmond	E. N. Beckwith, Petersburg.
Wisconsin	Frank M. Givens, Fond du Lac.	E. B. Heimstreet, Janesville.
Province of Quebec.	L. Lachance, Montreal	Wm. Ahern, Montreal.

LOCAL ASSOCIATIONS.

*Presidents.**Secretaries.*

Allegany Co., N. Y	M. H. Scott.	S. W. Crittenden, Wellsville.
Cleveland, O.		Jos. Feil, Cleveland.
Kennebec Val., Me.	W. H. Fuller	Geo. Cushing, Skowhegan.
Kings Co., N. Y	Chas. R. Paddock, Brooklyn.	F. N. Bliss, Brooklyn.
Lancaster Co., Pa.	Thos. B. Bechtold, Lancaster.	A. A. Hubley, Lancaster.
New York German Apothecaries	Adolph Tscheppe	Ludwig G. W. Ruprecht.
Norfolk and Ports- mouth, Va.		J. W. Thomas, Jr., Norfolk.
Richmond, Va.	Hugh Blair	Jos. Anthony.

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

*Presidents.**Secretaries.*

Louisville.	Oscar A. Beckman	Oscar C. Dilly.
Mass. (Boston).		John H. Greer.
Michigan University.	T. F. Wrampelmeier, Ann Arbor.	S. E. Parkill, Owosso.
New York.	B. Frank Hays.	Chas. F. Heebner.
Philadelphia.	Wallace Procter	Wm. E. Krewson.
Pittsburgh.		Fred. W. Eggers, Allegheny.
St. Louis	Wm. C. Bolm	H. M. Whelpley.

LIST OF PUBLICATIONS RECEIVED

FOR THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Institution at Washington.

JOHN M. MAISCH,

143 North Tenth Street, Philadelphia, Pa.

- American Druggist, New York, 1886.
 Deutsch-Amerikanische Apotheker Zeitung, New York, 1886.
 Oil, Paint, and Drug Reporter, New York, 1886.
 Pharmaceutical Record, 1886.
 Pharmaceutische Rundschau, 1886.
 The Druggists' Circular, 1886.
 Report of the Trustees of the New York State Library for 1885.
 American Journal of Medical Sciences, Philadelphia, 1886.
 American Journal of Pharmacy, Philadelphia, 1886.
 The Western Druggist, Chicago, 1886.
 The National Druggist, St. Louis, 1886.
 Transactions of the Academy of Science of St. Louis, IV, 4.
 Report of the St. Louis Public Library, 1884-85.
 Fifth Biennial Report of the State Librarian of Kansas, 1884-86.
 The Canadian Pharmaceutical Journal, Toronto, 1886.
 Pharmaceutical Journal and Transactions, London, 1886.
 Yearbook of Pharmacy and Transactions of the British Pharmaceutical Conference, 1885.
 General Index to the Year-Book for 1864-1885.
 The Chemist and Druggist, London, 1886.
 The Chemists' and Druggists' Diary for 1887.
 Proceedings of the Philosophical Society of Glasgow, XVI.
 Archiv der Pharmacie, Halle, 1886.
 Zeitschrift des Allgemeinen Oesterreichischen Apotheker-Vereines. Wien, 1886.
 Anzeiger der K. K. Akademie der Wissenschaften. Wien, 1886.
 Sitzungsberichte der K. B. Akademie der Wissenschaften, 1885, 1-4.
 Nachrichten von der K. Gesellschaft der Wissenschaften zu Göttingen, 1885.
 Bollettino delle Pubblicazioni Italiane, 1886.
 Annual Report of the State Librarian of New Jersey, 1885.
 Annual Report of the Astor Library Company of the City of New York, 1885.
 Calendar of the University of Michigan for 1885.
 Catalogue of the University of Vermont and State Agricultural College, 1886.
 Proceedings of the American Academy of Arts and Sciences, New Series XIII, II.
 Transactions of the South Carolina Medical Association, 1886.
 The Proceedings of the different State Pharmaceutical Associations are sent to the Reporter on the Progress of Pharmacy, Prof. C. L. Diehl, Louisville, Ky.

LIST OF SOCIETIES, LIBRARIES, JOURNALS, AND INDIVIDUALS,

TO WHOM COMPLIMENTARY COPIES OF THE PROCEEDINGS OF THIS ASSOCIATION ARE
FORWARDED.

The State Libraries of all the States in the Union except Connecticut. (At the request of the State Librarian of Connecticut, a copy of the Proceedings is sent to Trinity College.)

Maine Insane Asylum,	Augusta, Maine.
Bowdoin College,	Brunswick, "
Dartmouth College,	Hanover, New Hampshire.
Amherst College,	Amherst, Massachusetts.
Harvard University,	Cambridge, "
Massachusetts College of Pharmacy,	Boston, "
American Academy of Arts and Sciences,	" "
Boston Athenæum,	" "
City Library,	" "
City Hospital,	" "
Massachusetts General Hospital,	" "
Medical Library Association,	" "
University of Vermont,	Burlington, Vermont.
Brown University,	Providence, Rhode Island.
Medical Journal and Library Association,	Hartford, Connecticut.
Trinity College,	" "
Silas Bronson Library,	Waterbury, "
Yale College,	New Haven, "
Albany College of Pharmacy,	Albany, New York.
College of Pharmacy of the City of New York,	New York, New York.
Literary and Scientific Society of German Apothecaries,	" "
American Druggist,	" "
Deutsch-Americanische Apotheker Zeitung,	" "
Druggists' Circular,	" "
Oil, Paint, and Drug Reporter,	" "
Pharmaceutical Record,	" "
Pharmaceutische Rundschau,	" "
Astor Library,	" "
Mercantile Library,	" "
Long Island Historical Society,	Brooklyn, "
New Jersey State Lunatic Asylum,	Trenton, New Jersey.
Philadelphia College of Pharmacy,	Philadelphia, Pennsylvania.
Academy of Natural Sciences,	" "
American Journal of Medical Sciences,	" "
American Philosophical Society,	" "
College of Physicians,	" "

Franklin Institute,	Philadelphia, Pennsylvania.
Mercantile Library,	" "
Pennsylvania Hospital,	" "
Philadelphia Library,	" "
Pittsburgh College of Pharmacy,	Pittsburgh, "
Maryland College of Pharmacy,	Baltimore, Maryland.
Maryland Academy of Sciences,	" "
University of Maryland,	" "
National College of Pharmacy,	Washington, District Columbia.
Bureau of Education,	" "
Congressional Library,	" "
Department of Agriculture,	" "
Library of the American Medical Association,	" "
Smithsonian Institution,	" "
Surgeon General, United States Army,	" "
Surgeon-General, United States Marine Hospital Service,	" "
Surgeon-General, United States Navy,	" "
United States Patent Office,	" "
Richmond Pharmaceutical Association,	Richmond, Virginia.
South Carolina Medical Association, Dr. J. L. Dawson,	
Secretary,	Charleston, South Carolina.
Louisville College of Pharmacy,	Louisville, Kentucky.
Cincinnati College of Pharmacy,	Cincinnati, Ohio.
Cincinnati Academy of Medicine,	" "
Mussey Medical Library,	" "
Longview Asylum,	Carthage, Hamilton county, O.
University of Michigan,	Ann Arbor, Michigan.
Chicago College of Pharmacy,	Chicago, Illinois.
The Western Druggist,	" "
St. Louis College of Pharmacy,	St. Louis, Missouri.
Academy of Science of St. Louis,	" "
National Druggist,	" "
St. Louis Mercantile Library,	" "
St. Louis Public School Library,	" "
University of Wisconsin,	Madison, Wisconsin.
Kansas State University,	Lawrence, Kansas.
Minnesota State Medical Society,	St. Paul, Minnesota.
California College of Pharmacy,	San Francisco, California.
Montreal College of Pharmacy, Montreal, Canada.	
Ontario College of Pharmacy, Toronto, Canada.	
Halifax Pharmaceutical Society, Halifax, Nova Scotia.	
Escuela de Farmacia, Mexico.	
Sociedad de Farmacia Argentina, Buenos Ayres.	
British Pharmaceutical Conference, London.	
Pharmaceutical Society of Great Britain, London, 17 Bloomsbury Square.	
Pharmaceutical Journal and Transactions, London.	
Chemical News, London, Boy Court, Ludgate Hill, E. C.	
Chemist and Druggist, London, 44 Cannon Street.	
British Museum, London.	
Philosophical Society, Glasgow.	
Liverpool Chemists' Association,	

- Association of Chemists and Druggists, Wolverhampton.
 Coventry and Warwickshire Pharmaceutical Association, Coventry.
 Pharmaceutical Society at Edinburgh, 36 York Place.
 Pharmaceutical Society of Ireland, Dublin.
 Nederlandsche Maatschappij ter bevordering der Pharmacie, Jacobus Polak, Secretary,
 Amsterdam.
 Académie Royale de Médecine de Belgique, Bruxelles.
 Société de Pharmacie Royale de Bruxelles.
 Société Royale des Sciences Médicales et Naturelles, Bruxelles.
 Société de Pharmacie d'Anvers.
 Bibliothèque de l'École supérieure de Pharmacie, Paris.
 Répertoire de Pharmacie, Paris.
 Schweizerische Wochenschrift für Pharmacie, A. Klunge, Aubonne.
 Zeitschrift d. Allg. Oesterreichischen Apotheker Vereines, Wien.
 K. K. Gesellschaft der Aerzte, Wien.
 K. Akademie der Wissenschaften, Wien.
 K. Bayer, Akademie der Wissenschaften, München.
 Pharmaceutisches Institut, Universität Erlangen.
 Universität Strassburg.
 Archiv der Pharmacie, Waisenhausbuchhandlung, Halle.
 K. Akademie der Wissenschaften, Göttingen.
 Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
 Pharmaceutisches Institut, Dorpat, Russia.
 Pharmaceutical Institution, Stockholm, Sweden.
 Kongelige Norske Universitet i Christiani.
 Archiv for Pharmacie, S. M. Trier, Kjobenhavn.
 Denmark's Apotheker Forening, Gust. Lodze, President, Odense.
 R. Biblioteca Nazionale, Firenze, Italy.
 Archivio di Farmazia, Roma, Italy.
 Pharmaceutical Society of Victoria, Melbourne, Australia.
 Pharmaceutical Society of New South Wales, Sydney.
 Pharmaceutical Society of New Zealand, Auckland.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulteration.
2. To encourage proper relations between Druggists, Pharmacutists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.
3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.
4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.
5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.
6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.
7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all meetings of the Association; in his absence or inability, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of President.

ARTICLE II. He and the Vice-Presidents shall be *ex officio* members of the Council.

ARTICLE III. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE IV. In meetings the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports, and communications, and order the vote upon all proper questions at the proper time.

ARTICLE V. In all ballotings, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division, the motion is lost.

ARTICLE VI. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality or impropriety, he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VII. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VIII. He shall appoint all committees, unless provided for in the By-Laws, or otherwise directed by the Association.

ARTICLE IX. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE X. He shall present at each Annual Meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

ARTICLE I. The Permanent Secretary shall be elected to hold office permanently during the pleasure of the Association. He shall receive from the Treasurer an annual salary of \$750, and the amount of his expenses incident to the meeting in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act; and shall notify every member of the time and place of each Annual Meeting.

ARTICLE IV. He shall be, *ex officio*, a member of the Council.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall be elected annually, near the close of the Annual Meeting, and shall reside at or near the place where the next Annual Meeting of the Association is to be held.

ARTICLE II. He shall assist the Permanent Secretary in his duties; shall co-operate with the Council and any local committee in making arrangements for the Annual Meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each Annual Meeting, the names of such members as have failed to pay their annual contributions for three years.

ARTICLE IV. He shall present a statement of his accounts at each Annual Meeting of the Council, that they may be audited; he shall receive an annual salary of \$600, and the amount of his expenses incident to the meeting, in addition to his salary.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services such sum as may be annually determined upon by the Council.

ARTICLE II. All journals and volumes received in exchange for the proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry, and Materia Medica, and the collateral branches of knowledge; on the changes in conditions of Pharmaceutical Institutions; together with such statistical, biographical, and obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted; shall be written in a form fitted for the printer, and shall be presented completed at the Annual Meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which shall be empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

ARTICLE II. The Council shall consist of seventeen members, nine of whom shall be elected by ballot by the Association, in the following manner: Three of them to serve for one year, three for two years, three for three years. At each subsequent Annual Meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, Secretary, Local Secretary, Treasurer, and Reporter on the Progress of Pharmacy of the Association, shall be *ex officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association, from one Annual Meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the Annual Meeting:

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance,—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section 1.* The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at one session of the Association the names of those candidates for membership which have been approved by the Committee on Membership, and the applicants shall be balloted for at the next session of the Council by the members present, when a vote of two-thirds shall be sufficient to elect them.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be balloted for without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings of the Association, a complete synopsis of the minutes of the Council, the reports of the President and committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as they may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

CHAPTER VII.

Of Committees.

ARTICLE I. There shall be elected annually five standing committees: A Committee on the Drug Market, and on the Revision of the U. S. Pharmacopœia, each to consist of five members; a Committee on Papers and Queries, a Committee on Prize Essays, and a Committee on Legislation, each to consist of three members.

ARTICLE II. The Committee on the Drug Market shall report annually the condition of the Drug Market, the fluctuations in the supply and demand of drugs and chemicals, the variations in quality, and the adulterations and sophistications coming under their observation or reported to them by others, with any suggestions or recommendations for the improvement or better regulation of the trade; and they shall be authorized to report upon any adulterations and sophistications of immediate interest, through the Pharmaceutical Journals, as soon as practicable after their discovery.

ARTICLE III. The Committee on Papers and Queries shall report, near the close of each Annual Meeting, a proper number of questions of scientific and practical interest,

the answers to which may advance the interest of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person writing a paper for the Association must, to insure its publication in the Proceedings, refer the same, with a synopsis of its contents, to the Committee on Papers and Queries previous to the third session.

ARTICLE V. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Papers and Queries, before the first annual session of the Association.

ARTICLE VI. The Committee on Prize Essays shall, within six months after the Annual Meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the Committee, with such comments upon the successful essay only as they may deem proper, may be published in the Journals of Pharmacy.

ARTICLE VII. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year.

ARTICLE VIII. It shall be the duty of the Committee on Revision of the United States Pharmacopœia to collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and feelings of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry, and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any person eligible to membership may make application in writing with the endorsement of any two members of the Association in good standing, to any member of the Council, who shall report his application to the said Council.

ARTICLE III. No person shall be a member of this Association, nor shall his name be placed upon the roll, until he shall have signed the Constitution and paid into the Treasury the sum of *Two Dollars* as an initiation fee, and the annual contribution for the current year, which sums must accompany the application.

ARTICLE IV. Every member shall pay in advance to the Treasury the sum of *Five Dollars* as his yearly contribution, and is liable to lose his membership by neglecting to pay said contribution for *three successive years*.

ARTICLE V. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of \$75 during the first year of his connection therewith, or after five years \$70, or after ten years \$60, or after fifteen years \$50, or after twenty years \$40, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE VI. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the Annual Meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year and the usual initiation fee: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials should be sent to the Permanent Secretary *at least two weeks* in advance of the Annual Meeting.

ARTICLE VII. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, Permanent Secretary, and Treasurer.

ARTICLE VIII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-Laws.

ARTICLE IX. Resignations of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE X. Any member may be expelled for improper conduct, or the violation of the Constitution, By-laws, or Ethics adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE XI. Pharmacists, chemists, and other scientific men, who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office, or vote at the meetings.

CHAPTER IX.

Of Meetings.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. The order of business at the first session of each Annual Meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. The Council shall read the names of the candidates for membership, as provided in Section 2, Article VIII., Chapter VI.

Section 6. Reports of committees shall be presented, read by their titles, the synopsis or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of Colleges and State Associations represented, requesting each delegation in turn to appoint one member, the persons so selected to act as a committee to nominate officers for the Association, the Standing Committees, and members of the Council for the ensuing year; in addition to which he shall appoint five members who are not delegates, to act with the committee.

Section 8. The minutes of the Council shall be read in full at the Annual Meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, their acts shall be revised, so as to be acceptable to the Association.

Section 9. Incidental business may be called up.

ARTICLE III. The order of business at the second session at each Annual Meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding meeting, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the Officers and Committees nominated shall be balloted for.

Section 4. The officers shall take their respective places.

Section 5. The Council shall present names recommended for membership.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

ARTICLE IV. At each subsequent session except such as may be held for specific purposes, after the expiration of one hour from the appointed time of meeting, the report of the Committee on Papers and Queries shall be considered, unless by a vote of three-fourths of the members present and voting thereon.

CHAPTER X.

Of Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. In all such points of order as are not noticed in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, Vice-Chairman, and Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices immediately after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council ; in his absence or on account of inability from any cause, the Vice-Chairman ; or, in the absence of both, a Chairman *pro tempore* shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of \$50.

ARTICLE II. He shall post in a conspicuous place in the meeting room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose, shall call and record the yeas and nays whenever they are required to be called ; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting.

CHAPTER IV.

Committee on Membership..

ARTICLE I. The Committee on Membership shall consist of five members of the Council, to be elected annually by ballot. The Permanent Secretary and the Treasurer of the

Association shall be *ex officio* members of this committee. The committee shall elect their chairman immediately after their election by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present the list of applicants for membership, who have complied with the requirements of the By-Laws of the Association, to the Council.

ARTICLE III. They shall furnish appropriate obituary notices of deceased members for publication in the Proceedings.

ARTICLE IV. The chairman shall receive an annual salary of \$150.

CHAPTER V.

On Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, who shall elect their chairman immediately after their own election by the Council.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Proceedings, and may select annually the portrait of a deceased member to be issued with the Proceedings.

CHAPTER VI.

On Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members. They shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the Permanent Secretary. They shall annually, at the meetings, and after due notice through the Pharmaceutical Journals, receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. After considering these applications, the Committee shall, at as early a date as possible, report to the Council, recommending such grants from the available funds as they may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

On Meetings.

ARTICLE I. The Council shall meet on the day immediately preceding that fixed for the assembling of the Association, and at such other times as they may adjourn to, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special meeting shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and Secretary.
2. Election of the Standing Committees of the Council, as follows:
 - a. Committee on Membership, consisting of five members of the Council, the Permanent Secretary and Treasurer.
 - b. Committee on Finance, three members.
 - c. Committee on Publication, five members.
 - d. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the meeting of the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment, and before the final adjournment, the minutes of the last session shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the standing committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its committees, and which can be disposed of by a positive or a negative vote, the Chairman of the Council, or the chairman of the committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the votes of three-fourths of the members present, it shall become a part of these By-Laws.

FORM OF APPLICATION FOR MEMBERSHIP.

APPROVING of the objects of the American Pharmaceutical Association, I am desirous of joining it in membership; and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them.

Name in full, ...

Address, ...

TESTIMONIALS.

The undersigned, members in good standing, being personally acquainted with
of
testify to his moral character, his skill as a practical druggist and pharmacist, and his professional probity and good standing, and they recommend him for membership in the American Pharmaceutical Association.

NAMES.

ADDRESS.

GENERAL RULES ON FINANCE.

ADOPTED 1883, AMENDED 1885.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several funds belonging to the Association; and bonds and bank books shall be in the name of the Treasurer, and the accounts of same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council.

Sixth, There shall be annually appointed, by the Council, an Examining Committee, this Committee to consist of three members residing in or near the same city or town, the chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Examining Committee, at such time and place in July of each year as said chairman may direct.

The Chairman of the Council shall forward to the Chairman of the Examining Committee, at the same time and place, the bonds, savings bank books, and accounts of the same that may be in his hands.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, savings bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Examining Committee.

Tenth, There shall be a meeting of the Examining Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and, previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. DeMeyer, *Brussels*, 1868.

Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.

Joseph Ince, *London*, 1882.

Dr. Robert Bentley, *London*, 1872.

Dr. J. Redwood, *London*, 1871.

Henry B. Brady, *Newcastle-on-Tyne*, 1871.

Richard Reynolds, *Leeds*, 1882.

Michael Carteighe, *London*, 1882.

George W. Sandford, *London*, 1882.

Thomas Greenish, *London*, 1882.

Geo. F. Schacht, *Clifton, Bristol*, 1882.

FRANCE.

Stanilas Martin, *Paris*, 1872.

Dr. J. Léon Soubeiran, *Montpellier*, 1871.

Dr. G. Planchon, *Paris*, 1877.

GERMANY.

Dr. Christian Brunnengraeber, *Rostock*, 1882.

Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.

Dr. Adolph Duflos, *Annaberg*, 1871.

Dr. Carl Schacht, *Berlin*, 1882.

Dr. F. A. Flückiger, *Strassburg*, 1868.

Dr. G. C. Wittstein, *Munich*, 1868.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.

J. von Martenson, *St. Petersburg*, 1882.

SWITZERLAND.

Dr. Edward Schaer, *Zurich*, 1877.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of life members in SMALL CAPITALS. Names of life members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA,

ALABAMA.

Mobile.

Candidus, Philip Charles	1857
Hawkins, Joseph Thomas	1878
Mohr, Charles	1871
Punch, William Francis	1874
Savage, Thomas Jameson	1881
Van Antwerp, Garet	1880

Selma.

Galt, Edward Pegram	1883
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ARKANSAS.

Hot Springs.

Cabell, George William	1880
Menard, Robert Patterson	1883
Newman, Alcuin Eason	1880
Pollard, Frank Wilder	1880

Little Rock.

Bond, John Barnitz	1883
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Searcy.

Zimmerman, John L.	1883
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CALIFORNIA.

San Francisco.

Beckett, Frederick Arthur	1885
Brackett, Aurick Smith	1868
Calvert, John.	1870
Dawson, John Henry	1882
Joy, Edwin Wolcott	1882
Lengfield, Abraham Louis	1879
Mack, Adolph	1880
<i>Moffitt, Thomas Sabatier</i>	1861
Runyan, Edward Wheelock	1875
Searby, William Martin	1882
Simpson, William	1870
<i>Steele, Henry</i>	1859

Steele, James Gurden	1859
Wenzell, William Theodore	1870

Alameda, Alameda Co.

Elbe, Constantine Berthold	1877
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Eureka, Humboldt Bay.

Powell, Robert Baldwin	1880
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Los Angeles.

Preuss, Edward Anthony	1882
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Red Bluff.

Darrough, Charles Henry	1884
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San Diego.

Wrampelmeier, Theodore John	1882
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Vallejo, Solano Co.

Frost, James	1870
Topley, James	1869

COLORADO.

Breckenridge.

Schumann, Peter John	1878
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Central City.

Best, John	1866
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Denver.

Frazer, George Blair	1880
Hartung, Hugo Rudolph.	1876
Scholtz, Edmund Louis	1881
Steinhauer, Frederick	1881
Walbrach, Arthur	1881

Salida.

Thurber, Allen Russell	1880
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COLUMBIA, DISTRICT OF.

Washington.

Becker, Charles	1875
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Boyd, George Washington	1883	Francis, Walter Russell	1882
Bury, Edward Berkley	1870	Gessner, Emil Adolph	1878
Christiani, Charles.	1874	Spalding, Warren Alphonso	1876
Coumbe, Oscar Henry	1883	Sperry, Herman Jay	1880
Cromwell, Zachariah William	1870	Wells, Romanta	1877
Duckett, Walter G.	1876		
Dufour, Clarence Reuter	1876	<i>New London.</i>	
Fickling, Charles Hollingshead	1883	Nichols, John Cutter	1886
Johnston, Henry Augustus	1883		
Knabe, Gustavus Alexander	1876	<i>Norwich.</i>	
Lewis, Samuel Edwin	1875	Osgood, Hugh Henry	1875
Lockhart, George Bradfield	1883	Sevin, Nathan Douglas	1875
Major, John Richards	1873		
Martin, John Charles	1883	<i>Putnam.</i>	
Milburn, John Alexander	1858	Dresser, George Edward	1886
Milburn, Washington Coad	1883		
Murray, Talbot Chambers	1883	<i>Stamford.</i>	
Nattans, Arthur	1883	Haight, William Bogardus	1872
Pettengill, Edward True	1880		
<i>Reinlein, Paul</i>	1856	<i>Thompsonville, Hartford Co.</i>	
Schaffhirt, Adolph Juhan	1876	Smith, Edward Newton	1885
Short, Joshua Eagan	1883		
Simms, Giles Green Craycroft	1860	<i>Waterbury.</i>	
Thompson, William Scott	1871	Dikeman, Nathan	1859
Walton, Joseph Richardson	1883	Munson, Luzerne Ithiel	1872
Wehrly, Thomas McAleer	1883	Wilcox, Frederick	1878
		Woodruff, Roderick Samuel	1876
		<i>West Winsted.</i>	
		Phelps, Dwight	1873
		<i>Willimantic.</i>	
		Wilson, Frank Milton	1883
		<i>Winsted.</i>	
		Renouff, James Theron	1877
		DAKOTA.	
		<i>Mitchell.</i>	
		Warne, Henry Lee	1881
		DELAWARE.	
		<i>Wilmington.</i>	
		Belt, Zedekiah James	1876
		Smith, Linton	1870
		FLORIDA.	
		<i>Apopka, Orange Co.</i>	
		Kent, Robert Restieaux	1855
		<i>Cedar Key.</i>	
		Wooldridge, Napoleon	1883
		<i>Fort George.</i>	
		Rollins, John Francis	1859

<i>Waldo.</i>	Coffin, Samuel Lockwood	1879
<i>Wheeler, Lucien Fitch</i>	Cowdrey, Robert Hall	1879
	Dale, William Macmillan	1880
GEORGIA.	EBERT, ALBERT ETHELBERT	1864
<i>Albany.</i>	Fiske, Calvin J	1869
Welch, Leonard Edward	Fuller, Oliver Franklin	1869
	<i>Gale, Edwin Oscar</i>	1857
<i>Atlanta.</i>	<i>Gale, William Henry</i>	1857
Behre, Charles Henry Ernst	Garrison, Herod Daily	1869
Bradfield, Louis Henry	Grassly, Charles William	1884
Jacobs, Joseph	Guy, George Omar	1884
Rankin, Jesse Willis	Hallberg, Carl Swante Nicanor	1879
Schumann, Theodore	Hamilton, Emil	1881
	Hartwig, Charles Ferdinand	1881
<i>Augusta.</i>	Henes, William Frederick	1876
Durban, Sebastian Charles	Heuermann, Henry William	1869
Land, Robert Henry	Hogey, Julius Henry	1880
	Jacobus, Judson Schradlow	1870
<i>Macon.</i>	Johnson, Stuart William	1881
Brunner, Norman Isaac	Kadlec, Lawrence Wesley	1880
Hunt, Leonard Washington	Lord, Thomas	1882
Ingalls, John	Martin, Hugo W. C	1881
<i>McConville, Thomas Aloysius</i>	Maynard, Henry Sherman	1880
	<i>McPherson, George</i>	1865
<i>Rome.</i>	Moore, James Penn	1872
Fenner, William Roane	Oldberg, Oscar	1873
IDAHO TERRITORY.	Parsons, John	1865
<i>Murray, Shoshone Co.</i>	Patterson, Theodore Henry	1869
Ingalls, Albert Orfila	Plautz, Charles Herman	1881
	Reinhold, William	1866
ILLINOIS.	Sargent, Ezekiel Herbert	1864
<i>Bradford, Stark Co.</i>	Scherer, Andrew	1884
Plummer, David Graham	Sommers, Frank Giddings	1877
Plummer, William Pitt	Truax, Charles	1882
	Wheeler, Charles Gilbert	1876
<i>Camp Point, Adams Co.</i>	WHITFIELD, THOMAS	1865
Bartells, George Case	Wilson, Julius Henry	1869
	Woltersdorf, Louis	1865
<i>Champaign,</i>	Zahn, Emil Augustus	1881
Cunningham, Albert Palmer	<i>Danville.</i>	
	Winslow, Edwin Cook	1879
<i>Chicago.</i>	<i>Galesburg.</i>	
Ade, Samuel Gottlob	Clark, Albert Burr, Jr	1868
Bartlett, Nicholas Gray		
BIROTH, HENRY	<i>Highland.</i>	
Blahnik, Lorenz	Knoebel, Edmund	1882
Blocki, William Frederick	Mueller, Adolphus	1871
Borland, Matthew Wilson		
Buck, George	<i>Mount Sterling.</i>	
Button, Charles Edwin	Rickey, Charles Francis	1885
Clapp, Chambers Brown		

Peoria.

Allaire, Charles Bowen 1880
 Zimmermann, Charles 1881

Peru, La Salle Co.

Hattenhauer, Robert Christopher . . 1881

Quincy.

Schroeder, Hermann 1871

Springfield.

Day, Charles Wesley 1873

INDIANA.

Anderson.

Buck, Albert Byron 1879

Aurora.

Riddell, James A 1879

Bremen.

Miller, Otho Fenn Smith. 1885

Cambridge City.

McCaffrey, James 1883

Evansville.

Schmidt, Florian Charles. 1882

Schlaepfer, Henry John 1879

Fairmount.

Edwards, Nathan Wilson 1879

Indianapolis.

Browning, Woodville 1882

Dill, J. Byron 1878

Driggs, Nathaniel S. 1881

Earnshaw, William Jonathan . . . 1881

Frauer, Herman Emanuel. 1881

Haag, Julius Alexander. 1879

Hurty, John Newell. 1882

Lambert, John Albert 1879

Lilly, Eli 1878

Lynn, Winfield Scott 1882

Martin, Emil 1878

Miller, Charles Edward 1880

Mueller, Louis Henry 1879

Schrader, Henry 1869

Sloan, George White 1857

Staley, Michael Conrad 1881

Jasper, Dubois Co.

Mehring, Joseph Andrew. 1882

Jeffersonville.

Loomis, John Clarence 1876

Kendallville.

Lohman, George Henry 1872

Lafayette.

Green, Arthur Lawrence. 1884

Hilt, David 1879

Warder, Robert Browne 1885

Yeakel, Nathan Webb. 1879

La Porte.

Weichsel, Franz 1881

Madison.

Harper, Frank Merriitt. 1874

Michigan City.

Shrader, John L 1880

New Albany.

Knoefel, August 1879

Peru.

Leist, Jacob Lawrence. 1881

Rensselaer.

Kanal, Emmet 1882

Seymour.

Andrews, Josiah Harding 1879

South Bend.

Eliel, Leo 1882

Tell City.

Schreiber, August 1876

Terre Haute.

Baur, Jacob 1879

Buntin, William Campbell 1874

Cox, David P. 1884

Vincennes.

Watjen, Herman J 1882

IOWA.

Burlington.

Wigert, Carl Reinhold. 1876

Cedar Falls, Black Hawk Co.

Bryant, William Cullen 1881

Clinton.

Major, Oscar 1880

Davenport.

Ballard, hn Winthrop 1871

Harrison, Jacob Hugh.	1883	<i>Coffeyville.</i>	
Thackeray, William Thomas	1884	Slosson, George.	1882
<i>Decorah.</i>		<i>Coldwater.</i>	
Weiser, Emilius Ilgenfritz.	1880	Sombart, John Edward.	1881
<i>Des Moines.</i>		<i>Dodge City.</i>	
Weaver, Charles Augustus	1880	Melvin, John Tracy	1882
<i>Dubuque.</i>		Sturtevant, Tyler Francis.	1880
Ferdinand, George Adam	1879	<i>Emporia.</i>	
Ruete, Theodore William	1870	Morris, Lemuel Iorwerth	1880
<i>Fort Dodge.</i>		<i>Florence.</i>	
Crawford, Robert Wilson	1881	Stanford, William Asbury	1881
<i>Fort Madison.</i>		<i>Lawrence.</i>	
Schafer, George Henry	1871	Leis, George	1869
<i>Indianola.</i>		Sayre, Lucius Elmer	1883
Buffington, Cyrus Adams	1880	<i>Leavenworth.</i>	
<i>Iowa City.</i>		Brown, Robert J.	1862
Boerner, Emil Louis	1877	<i>Peabody.</i>	
<i>Marshalltown.</i>		Robert, Daniel John.	1881
Birchard, Abner Theodore	1881	<i>Salina.</i>	
Townsend, Abram R.	1880	Seitz, Oscar	1881
<i>Monticello.</i>		<i>Topeka.</i>	
Tiarks, Hermann	1876	Merrell, Ashbel Hill	1884
<i>Muscatine.</i>		<i>Weir.</i>	
Krehe, John Theodor	1884	Walker, George	1881
<i>Sioux City.</i>		KENTUCKY.	
Moore, Silas Harwood.	1880	<i>Carrollton.</i>	
More, Arthur James.	1881	Geier, Oscar William.	1880
Scherling, Gustav.	1884	<i>Cloverport.</i>	
<i>Stuart.</i>		Martin, Charles Carroll	1881
Treat, Joseph Augustus	1885	<i>Covington.</i>	
<i>Waterloo.</i>		Zwick, George Albert	1874
Wangler, Conrad David	1876	<i>Eminence.</i>	
KANSAS.		Porter, Chelton Scott	1882
<i>Abilene.</i>		<i>Flemingsburg.</i>	
DeHuy, Bernard Henry	1883	Reynolds, John Jefferson.	1876
<i>Belle Plaine.</i>		<i>Frankfort.</i>	
Butler, George Frank	1883	Averill, William Henry	1874
<i>Cain City.</i>		<i>Louisville.</i>	
Crona, Sixtus Ewald Seme	1885	Beckman, Oscar Albert	1879
		Colgan, John.	1867
		Diehl, Conrad Lewis	1863

Fischer, Phil.	1883
Goebel, Edward	1884
Jones, Simon Newton	1870
Kessler, Edward Frederick	1879
Newman, George Abner	1866
Pfingst, Edward Charles	1874
PFINGST, FERDINAND JOHN	1867
Pfingst, Henry Adolph	1874
Rademaker, Hermann Henry	1879
Renz, Frederick Jacob	1883
Rogers, Wiley	1874
Scheffer, Emil	1872
Schiemann, Edward Bernard	1880
Schoettlin, Albert John	1882
Strassel, William	1870
Sutton, Peter Priest	1871

Shelbyville.

McKenney, Jesse Fisher	1878
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Uniontown.

Hardigg, William Leopold	1881
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LOUISIANA.

New Orleans.

Finlay, Alexander Kirkwood	1883
Keppler, Christian Lewis	1882
Lavigne, Jean Baptiste	1883
Lewis, Ben	1883
Lyons, Isaac Luria	1875
Mellon, John Joseph	1883
Moore, Thomas Ferguson	1878

Baton Rouge.

Brooks, Francis Marion	1879
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Bayou Goula.

Viallon, Paul Louis	1870
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Franklin.

Frere, Alexander Gabriel	1882
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Houma.

Gonaux, François	1883
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New Iberia.

Lee, James Augustin	1856
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Plaquemine.

Dellavallade, Jean Michel	1873
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Thibodeaux.

Roth, Eugene Norbert	1880
Thibodeaux, Joseph Theogine	1870

MAINE.

Augusta.

Partridge, Charles Kimball	1867
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Bangor.

Harlow, Noah Sparhawk	1859
Sweet, Abel Sylvester, Jr.	1883
Sweet, Caldwell	1881

Bath.

Anderson, Samuel	1876
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Belfast.

Moody, Richard Henry	1876
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Bethel.

Wiley, Goodwin Robert	1886
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Biddeford.

Boynton, Herschel	1875
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Blue Hill.

Morrill, Benjamin.	1876
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Eastport.

Shead, Edward Edes	1866
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Ellsworth.

Parcher, George Asa	1875
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Pittsfield.

Libby, Henry Fitzgerald	1882
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Portland.

Cummings, Henry Thornton	1853
Dana, Edmund, Jr.	1877
Frye, George Carlton	1879
Hay, Henry Homer	1867
Perkins, Benjamin Abbott	1878

Winterport.

Morrell, Mary Helen	1883
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MARYLAND.

Baltimore.

Baxley, Jackson Brown	1856
Brack, Charles	1876
Burrough, Horace	1883
Caspari, Charles, Jr.	1883
Culbreth, David Marvel Reynolds	1883
Dohme, Charles Emile	1863
Dohme, Lewis	1859
Eareckson, Edwin	1875
Edwards, William Fletcher	1883
Elliott, Henry Alexander	1859

Emerson, Isaac Edward	1883	Canning, Henry	1865
Emich, Columbus Valentine	1863	Carter, Solomon	1865
Frames, James Parker	1868	Chapin, William Amos	1880
Gosman, Adam John	1870	Colton, James Byers	1865
Hancock, John Francis	1863	Cramer, Max	1881
Jennings, Nathaniel Hynson	1857	CUTLER, EDWARD WALDO	1859
Lauer, Michael John	1865	Davenport, Bennett Franklin	1879
Lautenbach, Robert	1870	Dinsmore, George Frederick	1879
Monsarrat, Oscar	1856	<i>Doliber, Thomas</i>	1859
<i>Moore, Jacob Faris</i>	1856	Drury, Linus Dana	1871
<i>Perkins, Elisha Henry</i>	1857	Durkee, William Carley	1885
Risk, Clarence Henderson	1882	French, George Washington	1865
<i>Roberts, Joseph</i>	1856	Godding, John Granville	1875
<i>Russell, Eugene Janus</i>	1856	Goodale, Thomas Trefethen	1879
Russell, Edward Walton	1856	Hoyt, George Melwin	1875
Sappington, Richard	1870	Jenkins, Luther Lincoln	1867
<i>Sharp, Alpheus Thineus</i>	1855	Jones, James Taber	1875
Simon, William	1885	Jordan, William Henry	1871
Thompson, William Silver	1856	Kelly, Edward Samuel	1871
Thompson, William Partlow	1874	Lowd, John Colby	1871
Thomsen, John Jacob	1856	Markoe, George Fred. Holmes	1863
Thomsen, John Jacob, Jr.	1883	<i>Makm, James Samuel</i>	1853
Thornton, William Edward	1883	<i>Metcalf, Theodore</i>	1857
Tilyard, Charles Slade	1867	Mowry, Albert Daniel	1884
Webb, John Alansen	1870	O'Brien, James John	1875
WINKLEMAN, JOHN HENRY	1864	Patch, Edgar Leonard	1872
Woodward, Samuel Morris	1874	<i>Patten, Ichabod Bartlett</i>	1858
<i>Chester town.</i>		Pierce, William Herbert	1879
Stam, Colin Augustus	1882	Prescott, Horace Augustus	1875
Toulson, Melbourn Ashbury	1883	Restieaux, Thomas	1853
<i>Cumberland.</i>		Sawyer, William Frederick	1885
Herman, John George	1878	Sewall, David Jewett	1875
Shriver, Henry	1876	Sharples, Stephen Paschell	1875
Shryer, Thomas Wilson	1875	Shedd, Edwin Walter	1879
<i>Frederick City.</i>		SHEPPARD, SAMUEL AIRUS DARLING-	
Schley, Steiner	1878	TON	1865
<i>Hagerstown.</i>		Siegemund, Charles Augustus	1882
Winters, Jonas	1863	Smalley, Elijah	1860
MASSACHUSETTS.		Snow, Jesse Walker	1875
<i>Boston.</i>		Stowell, Daniel	1875
Babo, Leopold	1859	Tower, Levi, Jr.	1860
Bartlet, William Williams	1875	<i>Turner, Thomas Larkin</i>	1853
Bassett, Charles Harrison	1867	Wilson, Benjamin Osgood	1859
Bolles, William Palmer	1875	Winslow, Samuel Wallis	1875
Boyden, Edward Cleveland	1874	<i>Woodbridge, George Washington</i>	1859
Burley, Edward Porter	1877	<i>Andover.</i>	
<i>Burnett, Joseph</i>	1852	Parker, George Hawkins	1874
Campbell, Isaac Towle	1859	<i>Cambridge.</i>	
		Hubbard, John Henry	1866
		Wood, Edward Stickney	1879

Cambridgeport.

Bayley, Augustus Ramsey 1859
 Orne, Joel Stone 1859
 Orne, Charles Parker 1874

Charlestown.

Lincoln, Henry Ware 1853
 Marshall, Ernest Clifton 1875
 Stacey, Benjamin Franklin 1860

Chelesa.

Buck, John 1855
 Buck, John Lynian 1883

Dover.

Colcord, Samuel Marshall 1852

East Pepperell.

Denham, Charles Sumner 1875

Fitchburg.

Choate, John 1877
 Estabrook, Henry Arthur 1886

Great Barrington.

Eddie, Charles Hurlbert 1882
 Lillie, Charles Herbert 1875
 Whiting, Frederick Theodore 1863

Haverhill.

Emerson, Charles Betton 1883
 Frothingham, Edward Gilman 1875

Holyoke.

Ball, Charles Ely 1885
 Morgan, Richard Evan 1875

Lawrence.

Whitney, Henry Martin 1859

Lee.

Pease, Francis Merrick 1880

Lowell.

Bailey, Frederick 1869
 Butler, Freeman Hall 1874
 Hood, Charles Ira 1871
Kidder, Samuel. 1859

Lynn.

Colcord, Joseph Webster 1882

Marlborough

Hartshorn, Frederick Arthur 1880

Middleboro.

Drake, Charles William 1873

Natick.

Daniels, Samuel Olney 1875

New Bedford.

Blake, James Edwin 1866
 Bunker, Elihu 1885
 Hadley, Frank Rufus 1872
 Lawton, Charles Henry 1873
 Lawton, Horace Allen 1873
 Shurtleff, Israel Hammond 1875
 Taylor, John Pitman 1875
 Wright, Edward Ellsworth 1886

Newburyport.

Goodwin, William W. 1853

Newton.

Hudson, Arthur 1882

Newton Centre.

Noble, John Joseph 1875

North Andover.

Berrian, George Washington 1857
 Lawrence, John Herbert 1885

Peabody.

Grosvenor, Daniel Prescott 1881

Pittsfield.

Atwood, Luther Lee 1876

Quincy.

Whall, Joseph Stokes 1873

Rockland.

Easton, Luther Waite 1875
 Estes, Joseph Joslyn 1870

Rockport.

Blatchford, Eben 1857

Salem.

Luscomb, William Edmund 1881
 Nichols, Thomas Boyden 1876
 Price, Charles Henry 1882

Saugus.

Hill, James Ward Harris 1880

Shelbourne Falls.

Baker, Edwin 1875

Somerville.

Cowdin, George Henry 1875
 Flanagan, Lewis Cass 1875

Springfield.

Webber, Joseph Terrence 1873

Stockbridge.

Clark, William Bills. 1880

Taunton.

Drown, Lowell Appleton 1883

Walpole.

Pilsbury, Frank Otis. 1881

Waltham.

Johnson, Horace Irving 1880

Warren.

Harwood, Frank Lucian 1875

West Acton.

Hutchins, Isaiah. 1880

West Medford.

Browne, Clarence Edward 1880

West Stockbridge.

Moore, James Spencer 1882

Worcester.

Bush, William 1875

Scott, George Theodore 1883

Scott, Nelson Ryan 1859

Williams, Duane Burnett 1881

MICHIGAN.

Adrian.

Ross, Ellison Halsey 1880

Ann Arbor.

Brown, Henry Jefferson 1882

Eberbach, Ottmar 1869

Garrigues, Samuel Smith 1855

Prescott, Albert Benjamin 1871

Stevens, Alonzo Burdette 1885

Battle Creek.

Wardell, Robert C. 1860

Detroit.

Allen, Albert Willard 1885

Caldwell, James William. 1875

Hawkins, Henry 1880

Johnston, William 1860

Lyons, Albert Byron 1885

MacKimmie, George D 1881

Perry, Frederick William Riley 1885

Ronnefeld, Theodore 1866

Stone, Clarence George 1884

Vernor, James 1866

Webber, Joseph Le Roy 1886

East Saginaw.

Melchers, Henry 1869

Prall, Delbert Elwyn 1876

Grand Rapids.

Tibbs, William Henry 1871

Ionia.

Gundrum, George. 1882

Jackson.

Latimer, Robert Fulton 1857

Kalamazoo.

McDonald, George 1871

Manistee.

Lyman, Asahel Hubert 1884

Muskegon.

Jesson, Jacob. 1872

Nottawa, St. Joseph Co.

Todd, Albert May 1885

Red Jacket, Houghton Co.

Macdonald, Daniel Turner 1884

Saginaw City.

Keeler, William Henry 1872

Schoolcraft.

James, George Riley 1869

MINNESOTA.

Anoka.

Fries, Chas. Joseph Val. 1885

Duluth.

Boyce, Samuel F. 1871

Minneapolis.

Allen, E. Floyd 1885

Huhn, George 1884

Preston.

Weiser, Albert 1880

St. Paul.

Simmon, Karl 1880

Stierle, Adolph 1882

Sweeny, Robert Ormsby. 1866

Spring Valley.

Rhode, Claus Frederick 1885

MISSISSIPPI.

Aberdeen, Monroe Co.

Cordon, John Gray Myers 1882

Eckford, Joseph William 1883

Tindall, Graham McFarland 1880

Bay St. Louis.

Deléry, Edgar 1878

Fayette.

West, Howell Forman 1883

Greenville.

Finlay, John Pelham 1883

Holly Springs.

Athey, John Howard 1883

Jackson.

Ash, Matthew Franklin 1856

Port Gibson.

Shreve, John Alexander 1880

MISSOURI.

St. Louis.

Ahlbrandt, Henry Ernst 1877

Alexander, Maurice William 1871

Blank, Alois 1871

Boehm, Solomon 1871

Catlin, Ephron 1871

Chamberlain, Guilford Tracy 1853

Curtman, Charles Otto 1871

Good, James Michener 1871

Grandjean, Charles 1871

Grandjean, Eugene 1871

Hassebrock, Henry Fred. 1884

Hemm, Francis 1881

Klie, George Henry Charles 1878

Leitch, Arthur 1860

Mallinckrodt, Edward 1869

Meyer, Christian Fred. Gottlieb 1860

Morley, William Jarman 1876

Pauley, Frank Charles 1879

Physick, Henry Sandford. 1870

Richardson, James 1882

Richardson, Joseph Clifford. 1871

Sander, Enno. 1858

Scheffer, Henry William 1863

Sennewald, Ferdinand William 1865

Tomfohrde, John William 1878

Ude, George 1871

Uhlich, Ferdinand G. 1881

Vordick, August Henry 1874

Wall, Otto Augustus. 1884

Westmann, Frank Henry. 1882

Williamson, Edward John 1876

Carl Junction.

Morgan, James 1859

Carrollton.

Pettit, Henry M. 1860

Carthage.

Caffee, Amos Henry. 1886

Columbia.

Hurt, James Francis 1879

Glenwood.

Gray, Gilbert Dillon 1881

Hannibal.

Walker, Charles. 1881

Kansas City.

Arnold, Henry Clay 1881

Ford, James Mitchell 1881

Ford, William Thomas 1878

Gallagher, John Anthony. 1881

Graham, Willis Hamm. 1881

Lahme, Charles Adolph 1881

Love, Charles Edward. 1881

Young, Judson J. 1881

Macon.

Field, Amos 1871

Marshall.

Franklin, Philip Henry 1881

Mexico, Adrian Co.

Llewellyn, John Frederick 1867

Rich Hill.

Youngs, William 1883

Sedalia.

Fleischmann, Augustus Theodore 1885

Weston.

Parr, John Conrad 1856

NEBRASKA.

Omaha.

Goodman, Charles Frederick 1871

Kennard, Frank Bartlett 1883
 Kuhn, Norman Archibald 1878
 Oleson, Olaf Martin 1877

NEVADA.

Virginia City.

Perkins, William Alexander 1869

NEW HAMPSHIRE.

Claremont.

Spofford, Charles Byron 1884

Concord.

Eastman, Charles Smith 1874
 Underhill, George Francis 1874

Dover.

Pinkham, Alonzo Taylor 1874
 Rackley, Benjamin Franklin 1874
 TUFTS, CHARLES AUGUSTUS 1856
 Vickery, William Henry 1874

Greenville.

Hall, Charles Edwin 1884

Lake Village.

Dolloff, Albert Simeon 1886

Manchester.

Miville, Francis Charles 1877
 Perry, Bayard Taylor 1876

Nashua.

Russell, Elias Smith 1875
 Whitman, Nelson Samuel 1875

New Market.

Dearborn, George Luther 1853
 Twombly, John Herbert 1880

Portsmouth.

Preston, Andrew Peabody 1881
 Thacher, Joseph Haven 1859

Rochester.

Hanson, Dominicus 1878
 Sanderson, Stephen Francis 1880

Somersworth.

Moore, George 1859

Suncook.

Hildreth, Charles Francis 1874

NEW JERSEY.

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton 1880

Burlington.

Vandegrift, John A 1867

Camden.

Brown, Albert Potts 1870
 Test, Alfred William 1870

East Orange.

Davis, George Randolph 1883
 Rumsey, Samuel Louis 1876

Elizabeth.

Brant, Edmund Wade 1882
 Drake, Jonathan Baker 1875
 Kent, Henry Avery, Jr. 1880
 Loveland, William F 1882
 Oliver, William Murray 1875

Elizabethport.

Frohwein, Richard 1867

Englewood.

Rockefeller, Lucius 1880

Freshhold.

Walker, Ansell 1880
 Walker, John Putnam 1881

Hackensack.

Adams, Hazen Wooster 1879

Hoboken.

KLUSSMAN, HERMANN. 1876

Jersey City.

Abernethy, Maxwell 1865
 Dougherty, Samuel Edward 1875
 Turner, Isaac Worthington 1882
 White, George Henderson 1868
 Wienges, Conrad 1875

Keyport.

Warn, William Edgar 1886

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Moorestown.

Worthington, Jeremiah Willits . . . 1873

Morristown.

Carrell, Eugene Ayers . . . 1875

Dalrymple, Charles Hoagland . . . 1882

Mt. Holly.

WHITE, AARON SMITH . . . 1860

Newark.

Betzler, Jacob . . . 1880

Bruguier, Francis . . . 1876

Drescher, August . . . 1886

HOLZHAUER, CHARLES . . . 1873

Sayre, Edward Augustus . . . 1877

Sayre, William Henry . . . 1877

Smith, Charles Bradley . . . 1868

Smith, Israel Preston . . . 1876

Stamford, William Harrison . . . 1876

Townley, William Mattison . . . 1875

Van Winkle, Abraham . . . 1871

New Brunswick.

Kilmer, Frederic Barnett . . . 1886

Rust, William . . . 1870

Newton.

Ryerson, Henry Ogden . . . 1882

Orange.

Musler, Abram . . . 1883

Parsons, Robert Edwin . . . 1877

Orange Valley, Essex Co.

Yatman, John Lewis . . . 1880

Plainfield.

Miller, Joseph Gilbert . . . 1886

Reynolds, Howard Prescott . . . 1875

Shaw, Robert Johnston . . . 1875

Red Bank, Monmouth Co.

Lockwood, Samuel Alexander . . . 1880

Roselle.

Tiernan, Frank Mortimer . . . 1880

Salem.

Bassett, Joseph . . . 1880

Somerville.

Cook, Gilbert Snowden . . . 1886

South Amboy.

JACQUES, GEORGE WASHINGTON . . . 1869

Trenton.

De Cou, James Clarke . . . 1880

Mangold, Gustavus Adolph . . . 1875

Rickey, Randal . . . 1878

Vansant, Robert Hays . . . 1879

NEW YORK.

New York City.

Atwood, Herman White . . . 1873

Balluff, Paul . . . 1860

Balser, Gustavus . . . 1875

Bedford, Peter Wendover . . . 1859

Bendiner, Samuel Julius . . . 1882

Billings, Henry Merry . . . 1869

Buehler, Edward Handy . . . 1874

Campbell, Horace Willard . . . 1875

Carle, John, Jr . . . 1860

Chandler, Charles Frederic . . . 1867

Collins, Louis Dell . . . 1880

Currie, John Harper . . . 1858

Davis, Benjamin . . . 1869

Dick, Dundas . . . 1879

Ditman, Andrew Jackson . . . 1868

Dudley, Oscar Earle . . . 1877

Eimer, Charles . . . 1872

Fairchild, Benjamin Thomas . . . 1875

Fink, Frederick William . . . 1886

Fisher, William . . . 1862

Fougera, Edmund Charles . . . 1867

Foulke, James . . . 1881

Fraser, Edward Allen . . . 1873

Fuller, Henry Weld . . . 1865

Gardner, Robert Winslow . . . 1867

Hauenstein, William . . . 1883

Haviland, Henry . . . 1857

Hays, Benjamin Franklin . . . 1886

Hays, David . . . 1867

Hegeman, Johnson Niven . . . 1880

Herzfeld, Herman . . . 1885

Higgins, James Starkey . . . 1862

Hobart, Charles Henry . . . 1880

Hoffmann, Frederick . . . 1867

Hohenthal, Charles Frederick Lebe-

recht . . . 1865

Hudnut, Alexander . . . 1857

Ihlefeld, Conrad Heinrich . . . 1881

Ingard, Julius . . . 1882

Jungmann, Julius . . . 1879

Kalish, Julius . . . 1875

Knapp, Frank Fiero . . . 1880

Laber, Julius . . . 1881

Lazell, Lewis Thurber	1858	Cutts, Foxwell Curtis, Jr	1875
MacLagan, Henry	1883	Davis, William Mortimer	1879
Macmahan, Thomas Jackson	1871	Day, Carlos Erastus	1870
Main, Thomas Francis	1872	Daycock, William Henry	1874
Massey, William Morton	1885	De Forest, William Pendleton	1879
McIntyre, Byron Floyd	1876	Dennin, Charles	1875
McIntyre, Ewen	1873	Douglas, Henry, Jr	1875
McKesson, John, Jr	1867	Dunn, John Augustus	1867
Milhau, Edward Leon	1858	<i>Du Puy, Eugene</i>	1852
<i>Molwitz, Ernest</i>	1867	Eccles, Robert Gibson	1885
Morrison, Thomas Ormsby	1876	Heydenreich, Emile	1867
Neergaard, Sidney Herbert	1880	Jones, Thomas	1868
O'Neil, Henry Maurice	1879	Kitchen, Charles William	1865
Osann, Bernhard	1882	Krieger, Philip	1876
Osmun, Charles Alvin	1868	Lehn, Louis	1874
Otto, Charles Henry	1880	Levy, Adolph	1877
Painter, Emlen	1870	Livingston, Barent Van Buren	1872
Peixotto, Moses Levi Maduro	1869	McElhenie, Thomas Diamond	1872
Pfingsten, Gustavus	1873	Menninger, Henry Joseph	1866
Quakinbush, Benjamin Franklin	1886	<i>Newman, George Anthony</i>	1865
Reichard, Frederick Alfred	1871	Nicholas, William Charles	1884
Rice, Charles	1870	Nicot, Louis Emile	1875
Ricksecker, Theodore	1870	<i>Niebrugge, John August</i>	1861
Robbins, Charles Albert	1876	<i>Ollif, James Henry</i>	1867
Robbins, Daniel C	1862	Owens, Richard John	1860
Royce, Lucien Merriam	1866	Pyle, Cyrus	1859
Sands, George Gedney	1867	Ramsperger, Gustavus	1860
Schmid, Henry	1886	Reiss, Edward Charles	1882
Scofield, James Stephen	1867	Reusch, Ernst	1882
Seabury, George John	1876	Reynolds, Charles Edward	1882
Shearer, Edward Young	1880	<i>Snyder, Ambrose Chancellor</i>	1867
Sheils, George Emanuel	1860	Squibb, Edward Hamilton	1882
Skelly, James Joseph	1866	Squibb, Edward R	1858
Starr, Thomas	1870	Stevens, Luther Fuller	1879
Tscheppe, Adolph	1876	Strachan, William Edward	1880
Tuska, David	1881	Tartis, Alfred Joseph	1867
Wanier, George Simon	1876	Ubert, Julius	1876
Weinman, Oscar Christian	1873	Underhill, Joseph Garness	1879
White, Philip Augustus	1872	Wackerbarth, John	1883
Wichelus, Frederick	1881	Wynn, William	1867
Wickham, William Hull	1870		
Wilson, William	1876		
Wohlfarth, Justin	1879		
Zellhoefer, George	1876		

Brooklyn.

Aspinall, Walter Albert	1880
Benjamin, James Henry	1878
Brooks, George Washington	1879
Close, George Cassidy	1858
Curtiss, Charles Grenville	1866

Albany.

Clement, Henry Bratt	1880
French, William Barker	1880
Gaus, Charles Henry	1879
Gaus, Louis Henry	1880
Gibson, Charles H	1880
Husted, Alfred Birch	1879
McClure, Archibald	1880
McClure, William Henry	1880
Michaelis, Gustavus	1882

Sauter, Louis 1879
 Turner, George Heather 1880
 Walker, William John 1880
 Wheeler, Leonard Hiram 1883

Angola, Erie Co.

Oatman, Le Roy Sutherland 1872
 Penfold, Henry J. 1882

Athens.

Post, Elisha 1876

Auburn.

Stanley, Edgar Clark 1880

Au Sable Forks.

Smith, Jay Hungerford. 1883

Bergen.

Fisher, Amos Sawyer 1880

Binghamton.

Otis, Clark Zelotes 1886

Buffalo.

Drefs, Charles Adams 1882
 Gregory, Willis George, M. D. 1886
 Hayes, Horace Phillips 1880
 Peabody, William Huntington 1857
 Rano, Charles Orlando 1866

Catskill.

Du Bois, William Laneman 1880
 Dykeman, George Albert 1880
 Mott, George Frederick 1880

Cornwall, Orange Co.

Hazen, Peter Perry 1882

Croton Landing.

Henry, Charles (Dworniczak) 1881

Cuba.

Rolph, Charles W. 1882

East Greenbush, Rensselaer Co.

Munger, John F. 1881

Elmira.

Holmes, Clayton Wood 1873

Fishkill on Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873
 James, William Tefft 1882

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Gloversville, Fulton Co.

Miller, Jason Albert 1879
 Van Auken, Jerrie A. 1880

Hannibal.

Brewster, Wadsworth J. 1880

Holley, Orleans Co.

Bishop, Francis Myron. 1882

Hudson.

Richardson, Frank 1885

Hume, Alleghany Co.

Hopper, George Smith. 1881

Jamaica, L. I.

Baylis, Lewis Fosdick 1880
 Goodale, Harvey Galusha 1879
 Peck, George Lyman 1883

Johnstown.

Cahill, John Francis 1880

Kinderhook.

Van Alstyne, Franklin Butler 1882

Kingston.

Dedrick, William Frederick 1884

Little Falls, Herkimer Co.

Hurley John 1882

Lockport.

Rommel, Emanuel 1882
 Sweet, Frederick K. 1880

Luzerne, Warren Co.

Miller, George Yerrington 1872

Malone.

Miller, Robert McCleverty 1880

Middletown.

KING, JAMES THEODORE. 1859
 Rogers, William Henry 1869

Mount Vernon.

Gill, George 1872

Newburgh.

Chapman, Isaac C. 1882
 Gorham, John Ransom, Jr. 1879

Niagara Falls.

Griffith, Hiram Elijah 1875

Nyack, Rockland Co.

De Graff, David 1879

Olean.

Coon, James Van Deventer 1880

Port Jervis.

Cook, George Edward 1872

Potsdam.

Thatcher, Harvey Dexter 1865

Richfield Springs.

Smith, Willard Alfred 1880

Rochester.

Aman, Henry 1882

Davis, Edward Hatch 1880

Haass, G. Herman 1872

Paine, James Dixon. 1857

Schmitt, Joseph Max. 1882

Smith, Willard 1880

Rome.

Bissell, John Gordon 1875

Broughton, Albert James 1876

Owens, James Alanson. 1882

Sag Harbor.

Tooker, William Wallace 1879

Sand Bank.

Rich, Willis Simmons 1882

Saratoga Springs.

Fish, Charles Frederick 1866

Mingay, James 1873

Pennington, Thomas Henry Sands . . 1877

Schenectady.

Davis, Edward Lansing 1881

Hanson, Willis Tracy 1880

Silver Creek, Chautauqua Co.

Montgomery, Melvin 1882

Spencerport.

Milliner, William Seward 1877

Stapleton, S. I.

Feeny, James. 1882

Stillwater, Saratoga Co.

Schermmerhorn, Winfield Scott . . . 1880

Syracuse.

Dawson, Edward Seymour, Jr. 1876

Snow, Charles Wesley 1876

Tompkinsville, S. I.

Bassett, John William 1875

Tonawanda, Erie Co.

Scoville, Charles Emery 1882

Utica.

Blaikie, William 1879

Cone, John Wright 1876

Warsaw.

Sweet, William Skiff. 1882

Waterville, Oneida Co.

Bissell, Emery Gilbert 1879

Wellsville, Alleghany Co.

Hall, Edwin Bradford 1879

Yonkers.

Eschmann, Frederick William Rudolf. 1880

Finkel, Charles Edwin 1880

NORTH CAROLINA.

Chapel Hill.

Saunders, Richard Banbury 1858

Durham, Orange Co.

Vaughan, Parry Wyche 1882

Fayetteville.

Hinsdale, Samuel Johnson 1875

Sedberry, Bond English 1882

Goldsboro.

Hatch, Eugene Francis 1883

Greensboro.

Porter, W. C. 1880

Raleigh.

Lee, Addison Sherwin 1873

Simpson, William 1873

Statesville.

Munds, James Cassidy 1878

Tarboro.

Zoeller, Edward Victor 1878

Washington.

Gallagher, Charles Kewell 1857

Wilmington.

Harding, John Haywood 1881

OHIO.

Cincinnati.

Bain, Andrew Watson 1874

Beebe, John Walter 1880

Eger, George 1864

Elfers, Joseph Clemens. 1864

Feemster, Joseph Hall 1873

Fennel, Charles Theodore Piderit . . 1886

Goodman, Emanuel 1879

Gordon, William John Maclester . . 1854

Greve, Theodore Lund August . . . 1864

Greyer, Julius 1880

Heineman, Otto 1864

Helman, Charles Martin 1864

Heun, Emil 1881

Hildreth, Newton Gough 1879

JUDGE, JOHN FRENCH 1866

Karmann, William 1864

Klayer, Louis 1884

Koehnken, Herman Henry 1875

Kuerze, Robert Meinrad 1880

Lammert, Cyrus Joseph 1881

Lloyd, John Uri 1870

Martin, William James 1881

Meininger, Albert 1881

Merrell, George 1879

Phillips, Charles Wilson 1881

Rendigs, Charles Peter 1876

Reum, Herman Frank 1864

Ruppert, John 1880

Sauer, Louis Wendlin 1882

Schreck, Leocadio Santos 1881

Schuerman, Frederick 1881

Serodino, Herman 1880

Vilter, Herman 1881

Voss, George William 1885

Wagner, Henry 1876

Walton, Harry Clifford 1881

Wells, Jacob David 1864

Yorston, Matthew Mackey 1864

Akron.

Amstrong, Andrew Morehouse . . . 1876

Smith, Joseph Stahle 1878

Inman, Charles Trask 1885

Avondale.

Thorpe, Abner 1879

Belleville, Richland Co.

Warren, Mrs. Ella F 1882

Bryan.

Snyder, Alva Leach 1873

Chillicothe.

Baumgartner, Frederick 1880

Howson, Arthur B 1886

Howson, Walter Henry 1875

Nipgen, John Alvin 1879

Circleville.

Evans, Samuel Barlow 1881

Cleveland.

Asplin, John Harding 1882

Bruce, James 1882

Cobb, Ralph Lathrop 1883

Dreher, Louis 1881

Feil, Joseph 1885

Gaylord, Henry Cleveland 1869

Gegelein, Frederick Leonhardt . . . 1881

Glines, George Walter 1881

Haber, Louis Anthony 1881

Hechler, George Louis 1882

Hopp, Louis Christopher 1876

Keiper, Louis 1881

Lehr, Philip 1885

Linden, Hugo Frederick 1882

May, Arthur Ferdinand 1881

Mayell, Alfred 1872

Myers, Daniel 1882

Parsons, Richard 1882

Rosenwasser, Nathan 1880

Schambs, George Matthias 1882

Schellentrager, Ernst August 1882

Scott, William Johnson 1872

Slosson, Frank West 1882

Smithnight, Albert 1882

Spencer, Peter Ignatius 1872

Spieth, William F. 1882

Urban, Jacob Phillip 1881

Vaupel, Charles Peter 1872

Columbiana.

Ink, Charles Elliott 1885

Columbus.

Bruck, Philip Henry 1884

Herbst, Frederick William 1882

Hoffman, Otto Louis 1883

Huston, Charles 1872

Karl, George James 1883
 Kauffman, George Beecher 1882
 Schueller, Ernst 1881
 Schueller, Frederick William 1880
 Sherwood, Louis Walker 1882

Dayton.

Kurfurst, Henry F 1881
 Weusthoff, Otto Sittell 1879

Delhi, Hamilton Co.

Carpenter, Samuel William 1883

Delphos.

Evans, Hugh W 1881
 Wahmhoff, Julius Henry 1880

Gallipolis.

Schaaf, Justus Henry 1875

Grand Rapids, Wood Co.

Thurston, Azor 1886

Hamilton.

Schwartz, John C 1871

Logan.

Harrington, Frank 1869

Massillon, Stark Co.

Baltzly, Zachariah Taylor 1876
 Kirchhofer, Peter Paul 1881

Middletown.

Johnson, Charles Brayton 1876

Morristown.

Fisher, John Vance 1883

Navarre.

Grossklaus, John Ferdinand 1859

New Madison, Darke Co.

Hagemann, James F. S 1882

North Baltimore, Wood Co.

Clark, Frank P 1882

Salem, Columbiana Co.

Hawkins, Michael Smith 1870

Springfield.

Casper, Thomas Jefferson 1867
 Coblentz, Virgil 1882
 Ludlow, Charles 1872
 Siegenthaler, Harvey N 1882

Tiffin.

Fleck, Jacob J 1883
 Marquardt, Jacob Frederick 1881

Toledo.

Hohley, Charles 1872
 Reed, Isaac Newton 1881

Troy.

Tobey, Charles William 1879

Watertown.

Bohl, Conrad 1881

Wooster.

Ohliger, Lewis Philip 1871

Zanesville.

Hatton, Edgar Melville 1878

OREGON.

Portland.

Sitton, Charles Edward 1878

PENNSYLVANIA.

Philadelphia.

Angney, John R 1867
 Baker, Walter Theron 1885
 Bauer, Louis Gustavus 1867
 Blair, Andrew 1865
 Blair, Henry Cowen 1868
 Borell, Henry Augustus 1874
 Boring, Edwin McCurdy 1867
 Bower, Henry 1860
 Bower, Henry Albert 1868
 Bowker, James 1876
 Bullock, Charles 1857
 Bunting, Samuel Sellers 1857
 Campbell, Hugh 1876
 Campbell, Samuel 1864
 Cook, Thomas Penrose 1877
 Dobbins, Edward Tompkins 1867
 Eberle, Charles Louis 1865
 Eddy, Henry Clay 1869
 Ellis, Evan Tyson 1857
 England, Robert 1868
 Fox, Peter Paul 1869
 Fruh, Carl Daniel Stephan 1876
 Gerhard, Samuel 1873
 Grahame, Israel Janney 1856
 Grove, John Eberly 1868
 Haenchen, Charles Eugene 1865

Hance, Edward H	1857	Walch, Robert Henry	1879
Hancock, Charles West	1868	Warner, William Richard	1857
Hassinger, Samuel Ellphat Reed	1880	Webb, William Henry	1867
Heintzelman, Joseph Augustus	1858	Weber, William	1872
Hoskinson, John Thomas, Jr	1881	Weidemann, Charles Alexander	1868
Jenk, William J	1858	Wendel, Henry Edward	1873
Johnson, Benjamin Franklin	1859	Wiegand, Thomas Snowdon	1857
Jones, Alexander Henry	1874	Wolff, Lawrence	1882
Jones, Daniel Sexton	1859	Worthington, Jeremiah Willits	1873
JONES, EDWARD CHARLES	1864	Wright, Archibald Wesley	1868
Keasbey, Henry Griffith	1873	Zeilin, John Henry	1859
Keeney, Caleb Reynolds	1868		
Keys, Roger	1868	<i>Allegheny City.</i>	
Kline, Mahlon Norwood	1876	Amor, Alpheus	1882
Koch, Louis	1872	Eggers, Frederick Hermann	1872
Krewson, William Egbert	1875	Keck, William Hugus	1885
MAISCH, JOHN M.	1856	Robertson, Archibald Craid	1882
Mattison, Richard Vornselons	1873		
McIntyre, William	1868	<i>Allentown.</i>	
McKelway, George Irwin	1874	Klump, Charles Christian	1880
Mellor, Alfred	1864		
Miller, Adolphus William	1868	<i>Beaver, Beaver Co.</i>	
Milligan, Decatur	1867	Andriessen, Hugo	1875
Moore, Joachim Bonaparte	1860		
Moorhead, William Walker	1876	<i>Bellefonte, Centre Co.</i>	
Murray, Bernard James	1882	Zeller, William Samuel	1881
Murray, Francis Marion	1876		
Newbold, Thomas Mitchell	1876	<i>Bellwood, Blair Co.</i>	
Ottinger, James Jeremiah	1876	Gardner, Charles H.	1881
Patterson, James Lemon	1876		
Perot, Thomas Morris	1857	<i>Bristol.</i>	
Pile, Gustavus	1881	Pursell, Howard	1880
Preston, David	1868		
Procter, Wallace	1874	<i>Carlisle.</i>	
REMINGTON, JOSEPH PRICE	1867	Horn, Wilbur Fisk	1876
Riley, Charles William	1868		
Rittenhouse, Henry Norman	1857	<i>Chambersburg.</i>	
Robbins, Alonzo	1865	Cressler, Charles Henry	1868
Roche, Edward Manning	1868		
Rosengarten, Mitchell George	1869	<i>Columbia.</i>	
Shivers, Charles	1860	Meyers, James Alfred	1867
Shinn, James Thornton	1860		
Shoemaker, Richard Martin	1869	<i>Danville.</i>	
Shryock, Allen	1868	Sechler, James C.	1878
Somers, Richard Miller	1876		
Spannagel, Charles Christian	1874	<i>Derry Station.</i>	
Stewart, Francis Edward	1884	Thomas, George Massena	1883
Stryker, Cornelius Whitenack	1886		
Taylor, Alfred Bower	1852	<i>Easton.</i>	
Thompson, William Beatty	1858	Weaver, John Archibald	1873
Trimble, Henry	1876		
		<i>Erie.</i>	
		Nick, Frederick	1883
		<i>Franklin.</i>	
		Riesenman, Joseph	1883

Hanover, York Co.

Eckert, Edwin Gilbert 1883
 Snively, Andrew Jackson 1883

Harrisburg.

George, Charles Theodore 1873
 Gorgas, George Albert 1884
 Gross, Edward Ziegler 1883
 Miller, Jacob Augustus 1873
 Weills, William Melanchthon Luther . 1885

Hyde Park, Luzerne Co.

Morgan, Benjamin George 1876

Lancaster.

HEINITSH, CHARLES AUGUSTUS . . . 1857

Lebanon.

Lemberger, Joseph Lyon 1858
 Redsecker, Jacob Henry 1881

Lewisburg, Union Co.

Schaffle, Samuel Wilson Wykoff . . . 1876

Lock Haven.

Prieson, Adolph 1880

McKeesport.

Bochert, George 1883
 Pritchard, Benjamin Elliott 1885

Mansfield, Tioga Co.

Ridgway, Lemuel Augustus 1882

Milton.

Alleman, Emanuel Allison 1880

Minersville.

Burns, John Kellar 1876

New Brighton.

Kennedy, Thomas 1880
 Walker, Francis William, Jr. 1878

Norristown.

Poley, Francis Henry 1880
 Stahler, William 1880

Pittsburg.

Beach, Clifton Hilliard 1883
 Cherry, James Bonbright 1868
 Emanuel, Louis 1878
 Holland, Samuel Smith 1876
 Hostetter, Charles Michael 1870
 Kelly, George Armstrong 1882
 Kerr, James, Jr. 1876

Nisbet, William Washington 1883
 Schneider, Mathias Martin 1883
 Slocum, Frank Leroy 1880
 Stevens, Salmon Henry 1885
 Todd, William James 1885
 Wilson, Albert Hemphill 1883

Pittston.

Rhoades, Stephen Howard 1876

Pottsville.

Deibert, Thomas Irvin 1882
 Kennedy, George Washington 1869

Reading.

Fox, Daniel Soder 1872
 Raser, John Bernard 1872
 Smith, Stephen Douglas 1883
 Stein, Jacob Henry 1869
 Ziegler, Philip Milton 1867

Scottdale, Westmoreland Co.

Cummings, Theodore Foster 1882
 McNeil, John Murray 1882

Shamokin.

Hutchison, Hazard Snowden 1885
 Smink, William Henry R. 1885

Shenandoah, Schuylkill Co.

McCarthy, Cornelius Joseph 1886

Shippensburg.

Fleming, Frank Byerly 1883

Smethport, McKean Co.

Armstrong, Alvin Backus 1882

Towanda.

Porter, Henry Carroll 1880

West Chester.

Evans, Joseph Spragg 1877

White Haven.

Driggs, Charles M. 1881

Wilkesbarre.

Wolf, Nathaniel 1878

Williamsport.

Cornell, Edward Augustus 1873
 Duble, Jesse Balderston 1870

York.

Patton, John Franklin 1880

RHODE ISLAND.

Newport.

BLACKMAN, LYMAN RAWSON	1865
Cotton, William Henry	1885
Downing, Benjamin Franklin, Jr.	1886
Taylor, James Henry	1875

Providence.

Alfreds, Henry James	1883
Blanding, William Bullock	1875
Calder, Albert Layton	1859
Danforth, Edmund Culver	1878
Greene, William Ray	1883
Leith, Harvey Isaac	1883
Mason, Norman Nelson	1875
Reynolds, William Keyes	1876
Walling, Walter Augustus	1886
Wellington, Arthur Wellesley.	1886
Wood, Mason B.	1882

Westerley.

Collins, Albert Burlingame.	1882
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SOUTH CAROLINA.

Aiken.

Harbers, William Henry.	1875
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Charleston.

Aimar, Charles Pons	1879
Burnham, Edward Steinmeyer	1874
Eckel, Augustus William.	1874
Luhn, Augustus Johann	1873
Marsteller, George Ludwig.	1883
Michaelis, Charles Otto	1874
Panknin, Charles Frederick	1874

Columbia.

Thomas, Oscar Ernest	1882
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TENNESSEE.

Memphis.

Hessen, George Archibald	1880
Robinson, James Scott.	1869
Safford, William Burr	1875

Nashville.

Burge, James Oscar	1878
Laurent, Eugene Leonard	1872
Thomas, James; Jr.	1875
Wharton, John Criddle.	1872
Wharton, William Henry	1876

TEXAS.

Bryan.

McLelland, Robert Clayton	1880
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El Paso.

Irvin, William Armstrong.	1879
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Fort Worth.

Harper, Harry Winston	1881
Powell, Thomas Wallace.	1874
Wells, Ebenezer Miller	1878

Galveston.

Preston, Calvin Walbridge	1884
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Marshall.

Lancaster, Edwin Walter	1884
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Waco.

King, Walter Blackburn	1883
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VERMONT.

Brandon.

Crossman, George Alvin	1872
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Burlington.

Van Patten, William James.	1876
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Chester.

Pierce, Frederick Webster	1879
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Morrisville.

Gates, Amasa O.	1876
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Rutland.

Higgins, Albert Warren	1870
Lewis, Elam Clark	1870

St. Johnsbury.

Bingham, Charles Calvin.	1875
Randall, George Dallas	1875

White River Junction.

Trask, Charles Mitchell	1875
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Windsor.

Paine, Milton Kendall	1875
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VIRGINIA.

Danville.

Cole, Howson White.	1882
Wiseman, Henry Adolphus.	1883

Fredericksburg.

Hall, Marshall Carter	1870
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Norfolk.

Jackson, Edward Calvert.	1883
Masi, Frederick Henry	1873

Petersburg.

Beckwith, Edward Ruffin	1886
Knock, Thomas Franklin	1882

Richmond.

Baker, Thomas Roberts	1873
Bodeker, Henry	1873
Purcell, John Barry	1875
Scott, William Henry	1873

WASHINGTON TERRITORY.

Seattle.

Kellogg, Gardner.	1882
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Walla Walla.

Holmes, Henry Elliott.	1880
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WEST VIRGINIA.

Charleston, Kanawha Co.

Boggs, Edwin Leslie	1872
Potterfield, Clarence Asbury	1882

Parkersburg.

Williams, Alfred Neveth.	1883
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Wheeling.

Bocking, Edmund	1874
Gray, William Howlett	1880
Menkemeller, Charles	1880
Williams, William Hudson.	1880
Young, Alexander Thomas.	1876

WISCONSIN.

Beloit.

Fenton, Franklin Sprague	1881
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Eau Claire.

Godding, Edward Robert	1884
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Fond du Lac.

Huber, Jacob Charles	1880
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Fountain City.

Bechmann, Charles Richard	1882
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Geneva.

Miner, Morris Ashbel	1880
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Janesville.

Prentice, Fred F	1876
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Lake Geneva.

Arnold, Robert Bruce	1879
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La Crosse.

Beyschlag, Charles	1880
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Madison.

Hollister, Albert Henry	1884
Power, Frederick Belding	1872

Mayville, Dodge County.

Sauerhering, Rudolph Aurelius	1884
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Milwaukee.

Abbott, Frank.	1880
Conrath, Adam.	1881
Crolius, Frank Marcelous	1884
Dadd, John Alfred	1880
Dohmen, Peter Lawrence	1884
Drake, John Ransom	1860
Gessler, Max.	1884
Kienth, Hans	1884
Schrank, Charles Henry	1876
Senier, Frederick Sutherland	1874

Neillsville.

Sniteman, Charles Clarence	1881
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Sheboygan.

Zaegel, Max Robert.	1884
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Watertown.

Eberle, Herman Theodore	1875
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DOMINION OF CANADA.

NEW BRUNSWICK.

Moncton.

Estey, Edmund Mar.	1882
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NOVA SCOTIA.

Halifax.

Simson, Francis Cook	1876
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Kentville.

Masters, Robert Silas	1883
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Pictou.

Fraser, Robert Peden	1885
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ONTARIO.

Goodrich.

Jordan, Frederick Francis	1877
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<i>Lindsay.</i>		<i>Windsor.</i>	
Gregory, Edmund.	1875	Priddy, Robert Samuel	1882
<i>London.</i>		PRINCE EDWARD ISLAND.	
Saunders, William	1860	<i>Charlottetown.</i>	
<i>St. Thomas.</i>		Dodd, Simon Walker	1884
Foster, William Orrville	1881	QUEBEC.	
<i>Stratford.</i>		<i>Montreal.</i>	
Waugh, George James.	1862	Gray, Henry Robert	1867
<i>Toronto.</i>		Mason, Alfred Henry	1884
Lander, John Cambridge.	1877	<i>Quebec.</i>	
Lowden, John	1875	McLeod, Roderick	1880
Robinson, William Sherlock	1877	<i>Three Rivers.</i>	
		Williams, Richard Wellington	1883

BERMUDA.

<i>Hamilton.</i>	
Heyl, James B.	1863

MEMBERS RESIDING IN EUROPE.

Burroughs, Silas Mainvielle, London, England	1876
Maisch, Henry Charles Christian, Göttingen, Germany	1885
Wellcome, Henry Solomon, London, England	1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Genois, Louis	1876
Hale, Frederick	1855
Rose, Henry John	1873

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

- Attfield, Dr. John, Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
- Bentley, Dr. Robert, Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
- Brady, Henry B., F. R. S., 29 Mosley Street, Newcastle-upon-Tyne, England.
- Brunnengraeber, Dr. Christian, Rostock, Germany.
- Carteighe, Michael, F. I. C., 180 New Bond Street, London, W., England.
- De Meyer, A. T., Bruxelles, Belgium.
- De Vrij, Dr. J. E., 54 Heerengracht, the Hague, Netherlands.
- Dragendorff, Dr. G., Professor of Pharmacy at the University of Dorpat, Russia.
- Duflos, Dr. Adolph, Professor, Annaberg, Germany.
- Flückiger, Dr. Frederick, Professor in the University of Strassburg, Germany.
- Gille, Norbert, Professor in the École Vétérinaire de l'Etat, Bruxelles, Belgium.
- Greenish, Thomas, F. C. S., 20 New Street, Dorset Square, London, N. W., England.
- Hager, Dr. Hermann, Pulvermühle bei Fürstenberg, Germany.
- Ince, Joseph, F. L. S., 11 St. Stephen's Avenue, Shepherd's Bush, W., London, England.
- Martenson, Magister J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.
- Martin, Stanislas, Paris, France.
- Planchon, Dr. G., Professor, Paris, France.
- Redwood, Dr. Theophilus, Professor of Pharmacy to the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W. C., England.
- Reynolds, Richard, F. C. S., Cliff Lodge, Hyde Park, Leeds, England.
- Sandford, George W., 47 Piccadilly, London, W., England.
- Schacht, Dr. Carl, 56 Mittelstrasse, Berlin, N. W., Germany, England.
- Schacht, George F., F. C. S., 52 Royal York Cresct., Clifton, Bristol, England.
- Schaer, Dr. Edward, Professor of Pharmacy, Zurich, Switzerland.
- Soubeyran, Dr. J. Léon, Professor of Pharmacy, École de Pharmacie, Montpellier France.
- Waldheim, Anton von, 17 Himmelpfortgasse, Wien, I., Austria.
- Wittstein, Dr. G. C., 47 Königstrasse, München, Germany.

ACTIVE MEMBERS.

- Abbott, Frank, No. 407 E. Water street, Milwaukee, Wis.
- Abernethy, Maxwell, No. 188 Newark avenue, Jersey City, N. J.
- Adams, Hazen W., No. 73 Main street, Hackensack, N. J.
- Ade, Samuel G., No. 126 Milwaukee avenue, Chicago, Ill.
- Ahlbrandt, Henry E., Fifteenth and Carr streets, St. Louis, Mo.
- Aimar, Charles P., No. 469 King street, Charleston, S. C.
- Alexander, Maurice W., Fourth and Market streets, St. Louis, Mo.
- Alfreds, Henry J., No. 311 Eddy street, Providence, R. I.
- Allaire, Charles B., No. 108 Main street, Peoria, Ill.
- Alleman, Emanuel A., care of Cyrus Brown, Milton, Pa.
- Allen, Albert W., Detroit, Mich.
- Allen, E. Floyd, No. 1020 Hennepin avenue, Minneapolis, Minn.
- Aman, Henry, No. 167 North Clinton street, Rochester, N. Y.
- Anderson, Samuel, No. 48 Front street, Bath, Me.
- Andrews, Josiah H., Chestnut and Second streets, Seymour, Ind.
- Andriessen, Hugo, P. O. Box 39, Beaver, Beaver county, Pa.
- Angney, John R., Fifth and Spruce streets, Philadelphia, Pa.
- Armor, Alpheus, No. 57 Taylor avenue, Allegheny City, Pa.
- Armstrong, Alvin B., State and Main streets, Smethport, McKean county, Pa.
- Armstrong, Andrew M., No. 106 East Market street, Akron, O.
- Arnold, Henry C., No. 428 Main street, Kansas City, Mo.
- Arnold, Robert B., Main and Broad streets, Lake Geneva, Wis.
- Ash, Matthew F., P. O. Box 129, Jackson, Miss.
- Aspinall, Walter A., Nos. 1147 and 1149 Fulton street, Brooklyn, N. Y.
- Asplin, John H., No. 227 Prospect street, Cleveland, O.
- Athey, J. Howard, Holly Springs, Miss.
- Atwood, Herman W., No. 846 Broadway, New York, N. Y.
- Atwood, Luther L., No. 7 North street, Pittsfield, Mass.
- Averill, William H., No. 435 Main street, Frankfort, Ky.
- Babo, Leopold, No. 12 Boylston street, Boston, Mass.
- Bailey, Frederick, P. O. Box 314, Lowell, Mass.
- Bain, Andrew W., City Hospital, Cincinnati, O.
- Baker, Edwin, Bridge street, Shelburne Falls, Mass.
- Baker, T. Roberts, No. 919 East Main street, Richmond, Va.
- Baker, Walter T., No. 1201 Chestnut street, Philadelphia, Pa.
- Ball, Charles E., No. 221 High street, Holyoke, Mass.
- Ballard, John W., No. 106 West Second street, Davenport, Iowa.
- Balluff, Paul, No. 632 Sixth avenue, New York.
- Balser, Gustavus, No. 137 Avenue B, New York.
- Baltzly, Zacharias T., Opera Block, Massillon, O.
- Bartells, George C., 130 East State street, Camp Point, Ill.
- Bartlett, Nicholas G., Twenty third street and Indiana avenue, Chicago, Ill.
- Bartlet, William W., No. 675 Shawmut avenue, Boston, Mass.
- Bassett, Charles H., No. 504 Washington street, Boston, Mass.
- Bassett, John W., Griffin and Hannah streets, Tompkinsville, S. I., N. Y.
- Bassett, Joseph, No. 119 Market street, Salem, N. J.
- Bauer, Louis G., Fifth street and Fairmount avenue, Philadelphia, Pa.
- Baumgartner, Frederick, Hotel Carlon Block, Chillicothe, O.

- Baur, Jacob, 701 Main street, Terre Haute, Ind.
- Baxley, J. Brown*, Howard and Franklin streets, Baltimore, Md.
- Bayley, Augustus R., No. 607 Main street, Cambridgeport, Mass.
- Baylis, Lewis F., P. O. Box 34, Jamaica, Queen county, L. I., N. Y.
- Beach, Clifton H., Shiloh and Sycamore streets, Pittsburgh, Pa.
- Bechmann, Charles R., Fountain City, Wis.
- Becker, Charles, No. 1367 Thirty-second street, West Washington, D. C.
- Beckett, Frederick A., No. 529 Market street, San Francisco, Cal.
- Beckman, Oscar A., No. 686 Broadway, cor. Baxter avenue, Louisville, Ky.
- Beckwith, Edmund R., Sycamore street, Petersburg, Va.
- Bedford, P. Wendover, P. O. Box 1807, New York, N. Y.
- Beebe, John Walter, Court and Plum streets, Cincinnati, O.
- Behre, Charles H. E., Schumann's Pharmacy, Atlanta, Ga.
- Belt, Z. James, No. 601 Market street, Wilmington, Del.
- Bendiner, Samuel J., No. 47 Third avenue, New York, N. Y.
- Benedict, Willis, No. 303 Congress avenue, New Haven, Conn.
- Benjamin, James H., No. 493 Tompkins avenue, Brooklyn, N. Y.
- Berrian, George W.*, North Andover, Mass.
- Best, John, No. 1 German Block, Central City, Col.
- Betzler, Jacob, No. 121 Union street, Newark, N. J.
- Beyschlag, Charles, 503 Main street, La Crosse, Wis.
- Billings, Henry M., No. 238 Greenwich street, New York, N. Y.
- Bingham, Charles C., No. 5 Bank Block, Main street, St. Johnsbury, Vt.
- Birchard, Abner T., Nos. 102-104 W. State street, Marshalltown, Iowa.
- BIROTH, HENRY, No. 111 Archer avenue, Chicago, Ill.
- Bishop, Francis M., Public Square Holley, Orleans county, N. Y.
- Bissell, Emery G., Main street, Waterville, Oneida county, N. Y.
- Bissell, John G., No. 45 Dominick street, Rome, N. Y.
- BLACKMAN, LYMAN R., No. 167 Thames street, Newport, R. I.
- Blahnik, Lorenz, No. 88 West Eighteenth street, Chicago, Ill.
- Blaikie, William, No. 202 Genesee street, Utica, N. Y.
- Blair, Andrew, Eighth and Walnut streets, Philadelphia, Pa.
- Blair, Henry C., Eighth and Walnut streets, Philadelphia, Pa.
- Blake, James E., No. 64 North Second street, New Bedford, Mass.
- Blanding, William B., Nos. 54 and 58 Weybosset street, Providence, R. I.
- Blank, Alois, No. 1353 South Fifth street, St. Louis, Mo.
- Blatchford, Eben*, No. 32 Main street, Rockport, Mass.
- Blocki, William F., No. 85 South Clark street, Chicago, Ill.
- Bochert, George, No. 87 Fifth street, McKeesport, Pa.
- Bocking, Edmund, No. 1 Odd Fellows' Hall, Wheeling, W. Va.
- Bodeker, Henry, Fifteenth and East Main streets, Richmond, Va.
- Boehm, Solomon, No. 800 Morgan street, St. Louis, Mo.
- Boerner, Emil L., Clinton St., Iowa City, Ia.
- Boggs, Edwin L., Kanawha Bank Building, Charleston, Kanawha county, W. Va.
- Bohl, Conrad, Watertown, O.
- Bolles, William P., Hotel Warren, Warren street, Boston, Mass.
- Bond, John B., cor. Main and Fifth streets, Little Rock, Ark.
- Borell, Henry A., No. 2043 Chestnut street, Philadelphia, Pa.
- Boring, Edwin M., Tenth street and Fairmount avenue, Philadelphia, Pa.
- Borland, Matthew W., No. 378 West Van Buren street, Chicago, Ill.
- Bower, Henry, Gray's Ferry road and Twenty-ninth street, Philadelphia, Pa.
- Bower, Henry A., Sixth and Green streets, Philadelphia, Pa.
- Bowker, James, Sixth and Vine streets, Philadelphia, Pa.
- Boyce, Samuel F., Superior street and Third avenue, Duluth, Minn.

- Boyd, George W., C street N. E., between Second and Third streets, Washington, D. C.
- Boyden, Edward C., Joy and Myrtle streets, Boston, Mass.
- Boynton, Herschell, No. 74 Main street, Biddeford, Maine.
- Brack, Charles, Ensor and Forrest streets, Baltimore, Md.
- Brackett, Aurick S., No. 142 Montgomery street, San Francisco, Cal.
- Bradfield, Louis H., Decatur and Pryor streets, Atlanta, Ga.
- Brant, Edmund W., No. 292 Broad street, Elizabeth, N. J.
- Brewster, Wadsworth J., Hannibal, N. Y.
- Bristol, Charles E., No. 48 Main street, Ansonia, Conn.
- Brooks, Francis M., Main street, Baton Rouge, La.
- Brooks, George W., No. 1161 Myrtle avenue, Brooklyn, N. Y.
- Broughton, Albert J., No. 64 Dominick street, Rome, N. Y.
- Brown, Albert P., Fifth and Federal streets, Camden, N. J.
- Brown, Henry J., No. 2 Main street, Ann Arbor, Mich.
- Brown, Robert J., No. 113 Delaware street, Leavenworth, Kan.
- Browne, Clarence E., West Medford, Mass.
- Browning, Woodville, No. 364 Blake street, Indianapolis, Ind.
- Bruce, James, No. 544 Prospect street, Cleveland, O.
- Bruck, Philip H., No. 24 N. High street, Columbus, O.
- Bruguier, Francis, No. 557 Market street, Newark, N. J.
- Brunner, Norman I., Fourth and Arch streets, Macon, Ga.
- Bryant, William C., No. 123 Main street, Cedar Falls, Black Hawk county, Ia.
- Buck, Albert B., Anderson, Ind.
- Buck, George, State and Madison streets, Chicago, Ill.
- Buck, John, No. 267 Broadway, Chelsea, Mass.
- Buck, John L., No. 267 Broadway, Chelsea, Mass.
- Buehler, Edward H., No. 170 William street, New York, N. Y.
- Buffington, Cyrus A., Hotel Block, Indianola, Ia.
- Bullock, Charles, No. 528 Arch street, Philadelphia, Pa.
- Bunker, Elihu, No. 403 Purchase street, New Bedford, Mass.
- Buntin, William C., No. 600 Main street, Terre Haute, Ind.
- Bunting, Samuel S., 145 N. Tenth street, Philadelphia, Pa.
- Burge, James O., Broad and Market streets, Nashville, Tenn.
- Burley, Edwin P., No. 43 Temple Place, Boston, Mass.
- Burnett, Joseph*, 27 Central St., Boston, Mass.
- Burnham, Edward S., 369 King street, Charleston, S. C.
- Burns, J. Kellar, Sunbury and Lecona streets, Minersville, Pa.
- Burrough, Horace, 92 Camden street, Baltimore, Md.
- Burroughs, Silas M., 8 Snow Hill, London, England.
- Bury, Edward B., No. 412 Eighth street, S. E., Washington, D. C.
- Bush, William, No. 56 Front street, Worcester, Mass.
- Butler, Freeman H., No. 141 Central street, Lowell, Mass.
- Butler, George F., 18 Fifth Avenue, Belle Plaine, Kan.
- Button, Charles E., No. 1558 Wabash avenue, Chicago, Ill.
- Cabell, George W., No. 211 Central avenue, Hot Springs, Ark.
- Caffee, Amos H., Carthage, Mo.
- Cahill, John F., No. 119 Main street, Johnstown, N. Y.
- Calder, Albert L., No. 163 Westminster street, Providence, R. I.
- Caldwell, James W., No. 242 Grand River avenue, Detroit, Mich.
- Calvert, John, Kearney and Clay streets, San Francisco, Cal.
- Campbell, Horace W., No. 84 Front street, New York, N. Y.
- Campbell, Hugh, Twenty-first and Locust streets, Philadelphia, Pa.
- Campbell, Isaac T., No. 239 West Broadway, Boston, Mass.
- Campbell, Samuel, No. 1412 Walnut street, Philadelphia, Pa.

- Candidus, Philip C., Dauphin and Cedar streets, Mobile, Ala.
- Canning, Henry, No. 109 Green street, Boston, Mass.
- Carle, John, Jr.*, No. 153 Water street, New York, N. Y.
- Carpenter, Samuel W., Washington and Lincoln streets, Delhi, Hamilton county, O.
- Carrell, Eugene A., Washington street, Morristown, N. J.
- Carslake, George M., Farnsworth, and Church streets, Bordentown, N. J.
- Carter, Solomon, No. 356 Washington street, Boston, Mass.
- Caspari, Charles, Jr., Fremont and Baltimore streets, Baltimore, Md.
- Casper, Thomas J., No. 41 East Main street, Springfield, O.
- Catlin, Ephron, Sixth street and Washington avenue, St. Louis, Mo.
- Chamberlain, Guilford T.*, Ninth and Chambers streets, St. Louis, Mo.
- Chandler, Charles F., Fourth avenue and Fiftieth street, New York, N. Y.
- Chapin, Fred. H., No. 259 Main street, Hartford, Conn.
- Chapin, William A., Beech and Lincoln streets, Boston, Mass.
- Chapman, Isaac C., No. 111 Water street, Newburgh, N. Y.
- Cherry, James B., No. 23 Fourth avenue, Pittsburgh, Pa.
- Choate, John, No. 208 Main street, Fitchburg, Mass.
- Christiani, Charles, No. 484 Pennsylvania avenue, Washington, D. C.
- Clapp, Chambers B., No. 527 State street, Chicago, Ill.
- Clark, Albert B., Jr., No. 9 Main street, Galesburg, Ill.
- Clark, Frank P., North Baltimore, Wood county, O.
- Clarke, William B., Main street, Clarke's Block, Stockbridge, Mass.
- Clement, Henry B., Nos. 684 and 686 Broadway, Albany, N. Y.
- Close, George C., 67 Cumberland street, Brooklyn, N. Y.
- Cobb, Ralph L., No. 112 Superior street, Cleveland, O.
- Coblentz, Virgil, No. 167 West Main street, Springfield, O.
- Coffin, Samuel L., No. 131 Fifty-first street, Chicago, Ill.
- Colcord, Joseph W., No. 153 Union street, Lynn, Mass.
- Colcord, Samuel M.*, Dover, Mass.
- Cole, Howson W., No. 66 Main street, Danville, Pa.
- Colgan, John, Tenth and Walnut streets, Louisville, Ky.
- Collins, Albert B., No. 48 Main street, Westerly, R. I.
- Collins, Louis D., No. 280 Greenwich street, New York, N. Y.
- Colton, James B., No. 766 Tremont street, Boston, Mass.
- Cone, John W., No. 205 Genesee street, Utica, N. Y.
- Conrath, Adam, No. 630 Chestnut street, Milwaukee, Wis.
- Cook, George E., No. 111 Pike street, Port Jarvis, N. Y.
- Cook, Gilbert S., Somerville, N. J.
- Cook, Thomas P., No. 838 North Ninth street, Philadelphia, Pa.
- Coon, James V. D., No. 31 Union street, Olean, N. Y.
- Cordon, John G. M., Main street, Aberdeen, Miss.
- Cornell, Edward A., Pine and Tenth streets, Williamsport, Pa.
- Cotton, William H., No. 226 Thames street, Newport, R. I.
- Coumbe, Oscar H., Tenth and E streets, N. W., Washington, D. C.
- Cowdin, George H., No. 25 Union Square, Somerville, Mass.
- Cowdrey, Robert H., No. 527 State street, cor. Harmon court, Chicago, Ill.
- Cox, David P., 801 Main street, Terre Haute, Ind.
- Cramer, Max, No. 1350 Tremont street, Boston, Mass.
- Crawford, Robert W., No. 9 Market street, Fort Dodge, Ia.
- Cressler, Charles H., Front and Main streets, Chambersburg, Pa.
- Crolius, Frank M., No. 101 Grand avenue, Milwaukee, Wis.
- Cromwell, Zachariah S., No. 480 Pennsylvania avenue, Washington, D. C.
- Crona, Sixtus E. S., No. 1 Grant street, Cain City, Kan.

- Crossman, George A., No. 2 Simond's Block, Brandon, Vt.
- Culbreth, David M. R., Charles and Eager streets, Baltimore, Md.
- Cummings, Henry T.*, No. 696 Congress street, Portland, Me.
- Cummings, Theodore F., No. 107 Pittsburgh street, Scottsdale, Westmoreland county, Pa.
- Cunningham, Albert P., No. 31 Main street, Champaign, Ill.
- Currie, John H.*, No. 206 East Twentieth street, New York, N. Y.
- Curtiss, Charles G., No. 833 De Kalb avenue, Brooklyn, N. Y.
- Curtman, Charles O., No. 3718 North Ninth street, St. Louis, Mo.
- CUTLER, EDWARD WALDO, No. 89 Broad street, Boston, Mass.
- Cutts, Foxwell C., Jr., No. 965 Fulton street, Brooklyn, N. Y.
- Dadd, John A., No. 221 Grand Avenue, Milwaukee, Wis.
- Dale, William M., Clark and Madison streets, Chicago, Ill.
- Dalrymple, Charles H., Washington street, Morristown, N. J.
- Dana, Edmund, Jr., No. 373 Congress street, Portland, Me.
- Danforth, Edmund C., No. 163 Westminster street, Providence, R. I.
- Daniels, Samuel O., Main and Summer streets, Natick, Mass.
- Darrough, Charles H., Main street, Red Bluff, Cal.
- Davenport, Bennett F., No. 751 Tremont street, Boston, Mass.
- Davis, Benjamin, No. 466 Grand street, New York, N. Y.
- Davis, Edward H., No. 101 State street, Rochester, N. Y.
- Davis, Edward L., Union and Bates streets, Schenectady, N. Y.
- Davis, George R., Main street, P. O. Box 474, Brick Church, N. J.
- Davis, William M., No. 689 De Kalb avenue, Brooklyn, N. Y.
- Dawson, Edward S., Jr., No. 13 South Salina street, Syracuse, N. Y.
- Dawson, John H., Twenty-third and Valencia streets, San Francisco, Cal.
- Day, Carlos E., No. 1101 Broadway, Brooklyn, N. Y.
- Day, Charles W., Springfield, Ill.
- Daycock, William H., No. 649 Bedford avenue, Brooklyn, N. Y.
- De Cou, James C., No. 44 E. State street, Trenton, N. J.
- De Forest, William P., Fifth avenue, cor. Dean street, Brooklyn, N. Y.
- De Graff, David, No. 3 Broadway, Nyack, Rockland county, N. Y.
- De Huy, Bernard H., Second and Spruce streets, Abilene, Kan.
- Dearborn, George L.*, No. 156 Main street, New Market, N. H.
- Dedrick, Wm. Fred., No. 28 Wall street, Kingston, N. Y.
- Deibert, Thomas I., No. 103 North Centre street, Pottsville, Pa.
- Delavallade, Jean M., Bank and Plaquemine streets, Plaquemine, La.
- Deléry, Edgar, P. O. Box 19, Bay St. Louis, Miss.
- Denham, Charles S., Main street, East Pepperell, Mass.
- Dennin, Charles, No. 33 Court street, Brooklyn, N. Y.
- Dick, Dundas, No. 37 Wooster street, New York, N. Y.
- Diehl, C. Lewis, Third and Broadway, Louisville, Ky.
- Dikeman, Nathan, No. 40 Bank street, Waterbury, Ct.
- Dill, J. Byron, Indianapolis, Ind.
- Dinsmore, George F., Boston, Mass.
- Ditman, Andrew J., No. 10 Astor House, New York, N. Y.
- Dobbins, Edward T., No. 1416 Walnut street, Philadelphia, Pa.
- Dodd, Simon W., Main street, Charlotte-town, P. E. I.
- Dohme, Charles E., Pratt and Howard streets, Baltimore, Md.
- Dohme, Louis, Pratt and Howard streets, Baltimore, Md.
- Dohmen, Peter L., No. 149 Reed street, Milwaukee, Wis.
- Doliber, Thomas*, No. 41 Central Wharf, Boston, Mass.
- Dolloff, Albert S., No. 107 Main street, Lake Village, N. H.
- Dougherty, Samuel E., No. 581 Bergen avenue, Jersey City, N. J.
- Douglas, Henry, Jr., No. 68 Wythe avenue, Brooklyn, N. Y.

- Downing, Benjamin F., Nos. 42 and 44 Broadway, Newport, R. I.
- Drake, Charles W., No. 275 Main street, Middleboro, Mass.
- Drake, Jonathan B., No. 132 Broad street, Elizabeth, N. J.
- Drake, John R., No. 365 S. Water street, Milwaukee, Wis.
- Drefs, Charles A., No. 166 Broadway, Buffalo, N. Y.
- Dreher, Louis, No. 302 Euclid avenue, Cleveland, O.
- Drescher, August, No. 108 Bowery street, Newark, N. J.
- Dresser, George E., Main street, Putnam, Conn.
- Drew, John W., No. 901 Pennsylvania avenue, Washington, D. C.
- Driggs, Charles M., Railroad and Berwick streets, White Haven, Pa.
- Driggs, Nathaniel S., Indianapolis, Ind.
- Drown, Lowell A., P. O. Box 102, Taunton, Mass.
- Drury, Linus D., Warren and Dudley streets, Boston, Mass.
- Duble, Jesse B., Pan and Fourth streets, Williamsport, Pa.
- Dubois, William L., No. 281 Main street, Catskill, N. Y.
- Du Puy, Eugene*, No. 1150 Fulton avenue, Brooklyn, N. Y.
- Duckett, Walter G., Twenty-second street and Pennsylvania avenue, Washington, D. C.
- Dudley, Oscar E., No. 62 E. One Hundred and Twenty-fifth street, New York, N. Y.
- Dufour, Clarence R., No. 1814 Fourteenth street, Washington, D. C.
- Dunn, John A., No. 56 Dougherty street, Brooklyn, N. Y.
- Durban, Sebastian Charles, No. 708 Broad street, Augusta, Ga.
- Durkee, William C., Boylston and Berkeley streets, Boston, Mass.
- Dykeman, George A., Main street, Catskill, N. Y.
- Eareckson, Edwin, Baltimore and High streets, Baltimore, Md.
- Earnshaw, William J., No. 38 Huron street, Indianapolis, Ind.
- Eastman, Charles S., Main and Depot streets, Concord, N. H.
- Easton, Luther W., Union near Webster street, Rockland, Mass.
- Eberbach, Ottmar, No. 12 South Main street, Ann Arbor, Mich.
- Eberle, Charles L., No. 4779 Germantown avenue, Philadelphia, Pa.
- Eberle, Herman T., care G. E. Eberle & Son, Watertown, Wis.
- EBERT, ALBERT E., No. 426 State street, Chicago, Ill.
- Eccles, Robert G., No. 94 Smith street, Brooklyn, N. Y.
- Eckel, Augustus W., No. 231 King street, Charleston, S. C.
- Eckert, Edwin G., High and Frederick streets, Hanover, Pa.
- Eckford, Joseph Wm., Commerce street, Aberdeen, Miss.
- Eddy, Henry C., Eighteenth and Lombard streets, Philadelphia, Pa.
- Eddy, Charles H., Main street, Great Barrington, Mass.
- Edwards, Nathan W., Main street, Fairmount, Ind.
- Edwards, William F., No. 334 East Baltimore street, Baltimore, Md.
- Eger, George, Nos. 839 and 841 Central avenue, Cincinnati, O.
- Eggers, Frederick H., No. 72 East Ohio Street, Allegheny City, Pa.
- Eimer, Charles, No. 205 Third avenue, New York, N. Y.
- Elbe, Constantine B., Park street, Alameda, Cal.
- Elfers, Joseph C., Plum and Longworth streets, Cincinnati, O.
- Eliel, Leo, No. 101 Main street, South Bend, Ind.
- Elliott, Henry A., No. 286 Lexington street, Baltimore, Md.
- Ellis, Evan T.*, No. 145 South Front street, Philadelphia, Pa.
- Emanuel, Louis, Second and Grant streets, Pittsburgh, Pa.
- Emerson, Charles B., Merrimac and Bridge streets, Haverhill, Mass.
- Emerson, Isaac E., Gilmor street and Lafayette avenue, Baltimore, Md.
- Emich, Columbus V., No. 136 North Howard street, Baltimore, Md.
- England, Robert, No. 800 South Tenth street, Philadelphia, Pa.

- Eschmann, F. W. R., P. O. Box 875, Yonkers, N. Y.
 Estabrook, Henry A., Fitchburg, Mass.
 Estes, Joseph J., Union and Church streets, Rockland, Mass.
 Estey, Edmund M., Moncton, New Brunswick.
 Evans, Hugh W., Delphos, O.
 Evans, Joseph S., P. O. Box 657, West Chester, Pa.
 Evans, Samuel B., No. 275 Main street, Circleville, O.
 Fairchild, Benjamin T., No. 60 Fulton street, New York, N. Y.
 Feemster, Joseph H., No. 99 Walnut street, Cincinnati, O.
 Feeny, James, Bay and Thompson streets, Stapleton, S. I., N. Y.
 Feil, Joseph, Cleveland, O.
 Fennel, Charles T. P., Eighth and Vine streets, Cincinnati, O.
 Fenner, William R., care of W. D. Hoyt & Co., Rome, Ga.
 Fenton, Frank S., W. Bridge St., Beloit, Wis.
 Ferdinand, George A., Dubuque, Ia.
 Fickling, Charles H., No. 1260 Thirty-second street, West Washington, D. C.
 Field, Amos, No. 26 Vine street, Macon, Mo.
 Fink, Frederick Wm., No. 128 William street, New York, N. Y.
 Finkel, Charles E., No. 4 Main street, Yonkers, N. Y.
 Finlay, Alexander K., No. 186 Camp street, New Orleans, La.
 Finlay, John P., Washington and Mulberry streets, Greenville, Miss.
 Fischer, Phil., No. 848 West Market street, Louisville, Ky.
 Fish, Charles F., No. 104 Broadway, Saratoga Springs, N. Y.
 Fisher, Amos S., Lake St. Bergen, N. Y.
 Fisher, John N., Odd Fellows' Hall, Morristown, O.
 Fisher, William, No. 327 Bleeker street, New York, N. Y.
 Fiske, Calvin J., No. 3640 Cottage Grove avenue, Chicago, Ill.
 Flanagan, Lewis C., No. 589 Somerville avenue, Somerville, Mass.
 Fleck, Jacob J., Washington and Perry streets, Tiffin, O.
 Fleischmann, Augustus T., Sedalia, Mo.
 Fleming, Frank B., No. 7 West Main street, Shippensburg, Pa.
 Ford, James M., No. 624 Wyandotte street, Kansas City, Mo.
 Ford, W. Thomas, No. 1305 Cherry street, Kansas City, Mo.
 Foster, William O., No. 221 Talbot street, St. Thomas, Ontario, Can.
 Fougera, C. Edmund, Broadway and Thirtieth street, New York, N. Y.
 Foulke, James, No. 91 Fulton street, New York, N. Y.
 Fox, Daniel S., No. 323 Franklin street, Reading, Pa.
 Fox, Peter P., No. 2300 Spruce street, Philadelphia, Pa.
 Frames, James P., Gray and Aisquith streets, Baltimore, Md.
 Francis, Walter R., No. 170 Orange street, New Haven, Conn.
 Franklin, Philip H., N. side Public Square, Marshall, Mo.
 Fraser, Edward A., No. 20 College Place, New York, N. Y.
 Fraser, Robert P., Water street, Pictou, Nova Scotia.
 Frauer, Herman E., No. 246 East Washington street, Indianapolis, Ind.
 Frazee, George B., No. 316 Curtis street, Denver, Col.
 French, George W., No. 360 Washington street, Boston, Mass.
 French, William B., No. 10 State street, Albany, N. Y.
 Frere, Alexander G., Main street, St. Mary's Parish, Franklin, La.
 Fries, Charles J. V., Main street, Anoka, Minn.
 Frohwein, Richard, No. 122 First street, Elizabethport, N. J.
 Frost, James, Nos. 169, 171, 173 Georgia street, Vallejo, Solano county, Cal.
 Frothingham, Edward G., Jr., Elm street, cor. Main and Water, Haverhill, Mass.
 Fröh, Carl D. S., No. 2321 Ridge avenue, Philadelphia, Pa.
 Frye, George G., No. 320 Congress street, Portland, Me.
 Fuller, Henry W., No. 35 Liberty street, New York, N. Y.
 Fuller, Oliver F., No. 220 Randolph street, Chicago, Ill.

- Gale, Edwin O.*, No. 85 South Clark street, Chicago, Ill.
- Gale, William H.*, No. 85 South Clark street, Chicago, Ill.
- Gallagher, Charles K.*, Second street, Washington, N. C.
- Gallagher, John A.*, Kansas City, Mo.
- Galt, Edward P.*, No. 34 Bond street, Selma, Ala.
- Gardner, Charles H.*, Bellwood, Blair county, Pa.
- Gardner, Robert W.*, No. 158 William street, New York, N. Y.
- Garrigues, Samuel S.*, Ann Arbor, Mich.
- Garrison, Herod D.*, No. 3510 Vincennes avenue, Chicago, Ill.
- Gates, Amasa O.*, Morrisville, Vt.
- Gates, Howard E.*, care of Wessells & Gates, Litchfield, Conn.
- Gaus, Charles H.*, No. 202 Washington avenue, Albany, N. Y.
- Gaus, Louis H.*, No. 254 South Pearl street, Albany, N. Y.
- Gaylord, Henry C.*, No. 110 Monument Square, Cleveland, O.
- Gegelein, Frederick L.*, Payne and Case avenues, Cleveland, O.
- Geier, Oscar W.*, No. 175 Main street, Carrollton, Ky.
- Genois, Louis*, residence unknown.
- George, Charles T.*, No. 1306 North Third street, Harrisburg, Pa.
- Gerhard, Samuel*, Hanover and Belgrade streets, Philadelphia, Pa.
- Gessler, Max*, No. 293 Pierce street, Milwaukee, Wis.
- Gessner, Emil A.*, No. 301 Chapel street, New Haven, Conn.
- Gibson, Charles*, No. 74 State street, Albany, N. Y.
- Gill, George P.*, P. O. Box 17, Mount Vernon, N. Y.
- Glines, George W.*, No. 147 Franklin avenue, Cleveland, O.
- Godding, Edward R.*, Bridge street, Eau Claire, Wis.
- Godding, John G.*, No. 278 Dartmouth street, Boston, Mass.
- Goebel, Edward*, No. 530 Main street, Louisville, Ky.
- Gonaux, Francois*, Houma, La.
- Good, James M.*, No. 2348 Olive street, St. Louis, Mo.
- Goodale, Harvey G.*, Jamaica, N. Y.
- Goodale, Thomas T.*, No. 41 Central Wharf, Boston, Mass.
- Goodman, Charles F.*, No. 180 Farnham street, Omaha, Neb.
- Goodman, Emanuel*, Sixth and Elm streets, Cincinnati, O.
- Goodrich, Stephen*, care of L. G. Moses & Co., Hartford, Conn.
- Goodwin, Lester H.*, State and Main streets, Hartford, Conn.
- Goodwin, William W.*, Newburyport, Mass.
- Gordon, William J. M.*, No. 142 Walnut street, Cincinnati, O.
- Gorgas, George A.*, No. 6 Market Square, Harrisburg, Pa.
- Gorham, John R., Jr.*, No. 79 Water street, Newburgh, N. Y.
- Gosman, Adam J.*, Charles and Mulberry streets, Baltimore, Md.
- Graham, Willis H.*, Eleventh and Olive streets, Kansas City, Mo.
- Grahame, Israel J.*, No. 35 North Twelfth street, Philadelphia, Pa.
- Grandjean, Charles*, No. 2828 North Fourteenth street, St. Louis, Mo.
- Grandjean, Eugene*, No. 2828 North Fourteenth street, St. Louis, Mo.
- Grassly, Charles W.*, No. 287 West Twelfth street, Chicago, Ill.
- Gray, Gilbert D.*, Main street, between Fourth and Fifth, Glenwood, Mo.
- Gray, Henry R.*, No. 144 St. Lawrence Main street, Montreal, Quebec, Can.
- Gray, William H.*, No. 1139 Market street, Wheeling, W. Va.
- Green, Arthur L.*, Lafayette, Ind.
- Greene, William R.*, No. 1 Westminster street, Providence, R. I.
- Gregory, Edmund*, Kent street, Lindsay, Ontario, Canada.
- Gregory, Willis G.*, No. 112 Niagara street, Buffalo, N. Y.
- Greve, Theodore L.*, John and Sixth streets, Cincinnati, O.
- Greyer, Julius*, Vine and Findlay streets, Cincinnati, O.
- Griffith, Hiram E.*, Grant's Block, Niagara Falls, N. Y.
- Gross, Edward Z.*, No. 119 Market street, Harrisburg, Pa.
- Grossklauss, John F.*, High street and Public Square, Navarre, O.

- Grosvenor, Daniel P., Jr., No. 35 Main street, Peabody, Mass.
- Grove, John E., No. 3326 Germantown avenue, Philadelphia, Pa.
- Gundrum, George, Ionia, Mich.
- Guy, George O., No. 428 West Van Buren street, Chicago, Ill.
- Haag, Julius A., Denison House, Indianapolis, Ind.
- Haass, G. Herman, No. 105 East Main street, Rochester, N. Y.
- Haber, Louis A., No. 283 St. Clair street, Cleveland, O.
- Hadley, Frank R., No. 64 North Second street, New Bedford, Mass.
- Haenchen, Charles E., No. 3844 Haverford street, Philadelphia, Pa.
- Hageman, James F. S., Washington street, New Madison, Darke county, O.
- Haight, William B., care Lockwood & Haight, Bogardus, Stamford, Conn.
- Hale, Frederick*, residence unknown.
- Hall, Charles E., Main street, Greenville, N. H.
- Hall, Edwin B., No. 173 Main street, Wells-ville, Alleghany county, N. Y.
- Hall, Marshall C., care Hall Brothers, Fredericksburg, Va.
- Hallberg, Carl S. N., No. 69 Dearborn street, Chicago, Ill.
- Hamilton, Emil, No. 3037 Indiana avenue, Chicago, Ill.
- Hance, Edward H., Callowhill and Marshall streets, Philadelphia, Pa.
- Hancock, Charles W., No. 3421 Spring Garden street, Philadelphia, Pa.
- Hancock, John F., cor. Baltimore street and Broadway, Baltimore, Md.
- Hanson, Dominicus, Central Square, Rochester, N. Y.
- Hanson, Willis T., No. 195 State street, Schenectady, N. Y.
- Harbers, William H., Laurens street, Aiken, S. C.
- Hardigg, William L., Second near Main street, Uniontown, Ky.
- Harding, John H., No. 124 Front street, Wilmington, N. C.
- Harlow, Noah S., No. 4 Smith's Block, Bangor, Me.
- Harper, Frank M., No. 45 East Main street, Madison, Ind.
- Harper, Harry W., No. 514 Main street, Fort Worth, Tex.
- Harrington, Frank, Werland's Block, Main street, Logan, O.
- Harrison, Jacob H., No. 305 Brady street, Davenport, Ia.
- Hartshorn, Frederick A., No. 15 Mechanics street, Marlborough, Mass.
- Hartung, Hugo R., No. 230 Fifteenth street, Denver, Col.
- Hartwig, Charles F., No. 476 Milwaukee avenue, Chicago, Illinois.
- Harwood, Frank L., Main street, Warren, Mass.
- Hassebrock, Henry F., No. 1000 North High street, St. Louis, Mo.
- Hassinger, Samuel E. R., Fairmount avenue and Twenty-third street, Philadelphia, Pa.
- Hatch, Eugene F., W. Centre and Walnut streets, Goldsboro, N. C.
- Hattenhauer, Robert C., No. 163 Water street, Peru, Ill.
- Hatton, Edgar M., Main and Fifth streets, Zanesville, O.
- Hauenstein, William, No. 44 West Third street, New York, N. Y.
- Haviland, Henry*, New York, N. Y.
- Hawkins, Henry, Hastings and Brewster streets, Detroit, Mich.
- Hawkins, Joseph T., Dearborn and Minor streets, Mobile, Ala.
- Hawkins, M. Smith, No. 20 Broadway, Salem, Columbiana county, O.
- Hay, Henry H.*, Free and Middle streets, Portland, Me.
- Hayes, Horace P., No. 312 Elk street, Buffalo, N. Y.
- Hays, B. Frank, No. 543 Fifth avenue, New York, N. Y.
- Hays, David, No. 207 Division street, New York, N. Y.
- Hazen, Peter P., Main street, Cornwall, Orange county, N. Y.
- Hechler, George L., No. 1099 Broadway, Cleveland, O.
- Hegeman, J. Niven, No. 756 Broadway, New York, N. Y.
- Heinemann, Otto, Laurel and Lynn streets, Cincinnati, O.
- HEINITSH, CHARLES A., No. 16 East King street, Lancaster, Pa.

- Heintzeiman, Joseph A.*, Ridge avenue and Master street, Philadelphia, Pa.
- Helman, Charles M.*, Findlay and Baymiller street, Cincinnati, O.
- Hemm, Francis*, South St. Louis, Mo.
- Henes, William F.*, No. 221 Randolph street, Chicago, Ill.
- Henry, Charles* (Dworniczak), Crcton Landing, N. Y.
- Hepburn, John*, No. 103 Main street, Flushing, N. Y.
- Herbst, Frederick W.*, No. 354 South High street, Columbus, O.
- Hermann, John G.*, Baltimore and Mechanic streets, Cumberland, Md.
- Herzfeld, Herman*, No. 19 Dey street, New York, N. Y.
- Hessen, George A.*, No. 220 Poplar street, Memphis, Tenn.
- Heuermann, Henry W.*, No. 120½ Clybourne avenue, Chicago, Ill.
- Heun, Emil*, Elmwood Place, Cincinnati, O.
- Heydenreich, Emile*, No. 169 Atlantic avenue, Brooklyn, N. Y.
- Heyl, James B.*, Vice Consul, Hamilton, Bermuda.
- Higgins, Albert W.*, No. 41 Merchants' Row, Rutland, Vt.
- Higgins, James S.*, No. 214 Delancy street, New York, N. Y.
- Hildreth, Charles F.*, No. 54 Main street, Suncook, N. H.
- Hildreth, Newton G.*, Cheviot, Cincinnati, Ohio.
- Hill, James W. H.*, Saugus, Mass.
- Hilt, David*, 84 Main street, Lafayette, Ind.
- Hinsdale, Samuel J.*, Market Square, Fayetteville, N. C.
- Hobart, Charles H.*, No. 10 Gold street, New York, N. Y.
- Hoffmann, Frederick*, No. 183 Broadway, New York, N. Y.
- Hoffman, Otto L.*, Fourth and Town streets, Columbus, O.
- Hogey, Julius H.*, No. 441 State street, Chicago, Ill.
- Hohenthal, Charles F. L.*, No. 857 Third avenue, New York, N. Y.
- Hohly, Charles*, No. 248 South St. Clair street, Toledo, O.
- Holland, Samuel S.*, Smithfield and Liberty streets, Pittsburgh, Pa.
- Hollister, Albert H.*, No. 25 Pinckney street, Madison, Wis.
- Holmes, Clayton W.*, No. 410 West Gray street, Elmira, N. Y.
- Holmes, Henry E.*, No. 19 Main street, Walla Walla, Wash. Ter.
- HOLZHAUER, CHARLES*, No. 787 Broad street, Newark, N. J.
- Hood, Charles I.*, Merrimac and Central streets, Lowell, Mass.
- Hopp, Lewis C.*, No. 198 Euclid avenue, Cleveland, O.
- Hopper, George S.*, Main street, Hume, Allegheny county, N. Y.
- Horn, Wilbur F.*, No. 32 West Main street, Carlisle, Pa.
- Hoskinson, J. Thomas, Jr.*, Front and Norris streets, Philadelphia, Pa.
- Hostetter, Charles M.*, No. 272 Penn avenue, Pittsburgh, Pa.
- Howson, Arthur B.*, Carlisle Block, Chilli-cothe, O.
- Howson, Walter H.*, Water street, Chilli-cothe, O.
- Hoyt, George M.*, No. 257 Columbus avenue, Boston, Mass.
- Huber, Jacob C.*, No. 450 Main street, Fond du Lac, Wis.
- Hubbard, John H.*, No. 468 Harvard street, Cambridge, Mass.
- Hudnut, Alexander*, No. 218 Broadway, New York, N. Y.
- Hudson, Arthur*, Centre street, Newton, Mass.
- Husted, Alfred B.*, No. 77 Eagle street, Albany, N. Y.
- Huhn, George*, No. 123 Nicollet street, Minneapolis, Minn.
- Hunt, Leonard W.*, Fourth street, Macon, Ga.
- Hurley, John*, Monroe street, Little Falls, Herkimer county, N. Y.
- Hurt, James F.*, Broadway, Columbia, Mo.
- Hurty, John N.*, No. 104 North Penn street, Indianapolis, Ind.
- Huston, Charles*, No. 43 South High street, Columbus, O.
- Hutchins, Isaiah, M. D.*, West Acton, Mass.
- Hutchison, Hazard S.*, Sunbury and Shamokin streets, Shamokin, Pa.
- Ihlefeld, Conrad H.*, No. 715 Eighth avenue, New York, N. Y.

- Imgard, Julius, No. 586 Sixth avenue, New York, N. Y.
 Ingalls, Albert O., Murray, Shoshone county, Idaho.
 Ingalls, John, Fourth and Poplar streets, Macon, Ga.
 Ink, Charles E., Columbiana, O.
 Inman, Charles T., No. 1184 East Market street, Akron, O.
 Irvin, William A., El Paso, Texas.
 Jacobs, Joseph, Marietta and Peachtree streets, Atlanta, Ga.
 Jacobus, Judson S., Thirty-first street and Indiana avenue, Chicago, Ill.
 Jackson, Edward C., No. 140 Freemason street, Norfolk, Va.
 JACQUES, GEORGE W., Broadway and Augusta street, S. Amboy, N. J.
 James, George R., No. 120 Grand street, Schoolcraft, Mich.
 James, William T., No. 103 Main street, Flushing, N. Y.
 Jenkins, Luther L., No. 119 Leverett street, Boston, Mass.
Jenks, William J., No. 160 North Third street, Philadelphia, Pa.
 Jennings, N. Hynson, No. 90 North Charles street, Baltimore, Md.
 Jesson, Jacob, Western avenue and Jefferson street, Muskegon, Mich.
 Johnson, Benjamin F., No. 301 East Girard avenue, Philadelphia, Pa.
 Johnson, Charles B., Third street, Middletown, O.
 Johnson, Horace J., No. 1 Rumford Building, Main street, Waltham, Mass.
 Johnson, Stuart W., Chicago, Ill.
Johnston, William, Nos. 153 and 155 Jefferson avenue, Detroit, Mich.
 Johnston, Harry A., No. 1001 O street, N. W., Washington, D. C.
 Jones, Alexander H., Ninth and Parrish streets, Philadelphia, Pa.
 Jones, Daniel S., Twelfth and Spruce streets, Philadelphia, Pa.
 JONES, EDWARD C., Fifteenth and Market streets, Philadelphia, Pa.
 Jones, James T., No. 855 East Fourth street, Boston, Mass.
 Jones, Simon N., First and Jefferson streets, Louisville, Ky.
 Jones, Thomas, No. 1060 and 1062 Fulton street, Brooklyn, N. Y.
 Jordan, F. Francis, Court-house Square, Goodrich, Ontario, Can.
 Jordan, William H., No. 135 Columbus avenue, Boston, Mass.
 Joy, Edwin W., No. 852 Market street, San Francisco, Cal.
 JUDGE, JOHN F., No. 264 Race street, Cincinnati, O.
 Jungmann, Julius, No. 1047 Third avenue, New York, N. Y.
 Kadlec, Lawrence W., No. 136 W. Twelfth street, Chicago, Ill.
 Kalish, Julius, No. 409 Grand street, New York, N. Y.
 Kanal, Emmet, S. side Washington street, Rensselaer, Ind.
 Karb, George J., Fourth and Main streets, Columbus, O.
 Karrman, William, No. 579 Freeman avenue, Cincinnati, O.
 Kauffman, George B., No. 183 North High street, Columbus, O.
 Keasbey, Henry G., No. 9 North Fifth street, Philadelphia, Pa.
 Keck, William H., No. 277 Federal street, Allegheny City, Pa.
 Keeler, William H., P. O. Box 585, Saginaw City, Mich.
 Keeney, Caleb R., Sixteenth and Arch streets, Philadelphia, Pa.
 Keiper, Louis, No. 780 Lorain street, Cleveland, O.
 Kelley, Edward S., Boylston and Berkeley streets, Boston, Mass.
 Kellogg, Gardner, Mill and Commercial streets, Seattle, Wash. Ter.
 Kelly, George A., Wood street and First avenue, Pittsburgh, Pa.
 Kennard, Frank B., No. 1312 Harney street, Omaha, Neb.
 Kennedy, George W., No. 103 North Centre street, Pottsville, Pa.
 Kennedy, Thomas, Broadway, New Brighton, Pa.
 Kent, Henry A., Jr., Park Drug Store, Elizabeth, N. J.
Kent, Robert R., Apopka, Orange county, Fla.
 Keppler, Christian L., No. 461 Dryades street, New Orleans, La.

- Kerr, James, Jr., No. 402 Smithfield street, Pittsburgh, Pa.
- Kessler, Edward F., Twentieth and Market streets, Louisville, Ky.
- Keys, Roger, Twelfth and Pine streets, Philadelphia, Pa.
- Kidder, Samuel, No. 35 Nesmith street, Lowell, Mass.
- Kienth, Hans, No. 608 Mitchell street, Milwaukee, Wis.
- Kilmer, Frederick B., Opera House, New Brunswick, N. J.
- KING, JAMES T., Main and South streets, Middletown, N. Y.
- King, Walter B., No. 47 Austin avenue, Waco, Texas.
- Kirchhofer, P. Paul, Massillon, Stark county, O.
- Kitchen, Charles W., Fulton and Washington streets, Brooklyn, N. Y.
- Klayer, Louis, Ninth and Elm streets, Cincinnati, O.
- Klie, G. H. Charles, No. 5100 North Broadway, St. Louis, Mo.
- Kline, Mahlon N., Nos. 309 and 311 North Third street, Philadelphia, Pa.
- Klump, Charles C., No. 537 Hamilton street, Allentown, Lehigh county, Pa.
- KLUSSMANN, HERMANN, Fourth street and Lafayette avenue, Hoboken, N. J.
- Knabe, Gustavus A., No. 505 Pennsylvania avenue, N. W., Washington, D. C.
- Knapp, Frank F., No. 362 Hudson street, New York, N. Y.
- Knock, Thomas F., No. 130 South avenue, Petersburg, Va.
- Knoebel, Edmund, Public Square, Highland, Ill.
- Knoefel, August, No. 19 W. Market street, New Albany, Ind.
- Koch, Louis, Fourth and Wood streets, Philadelphia, Pa.
- Koehnken, Herman H., Third and Mill streets, Cincinnati, O.
- Krehe, J. Theodore, No. 314 East Second street, Muscatine, Iowa.
- Krewson, William E., 1829 North Eighth street, Philadelphia, Pa.
- Krieger, Philip, Myrtle and Marcey streets, Brooklyn, N. Y.
- Kuerze, Robert M., Eighth and Depot streets, Cincinnati, O.
- Kuhn, Norman A., No. 124 South Fifteenth street, Omaha, Neb.
- Kurfurst, Henry F., No. 502 Erie avenue, Dayton, O.
- Laber, Julius, No. 874 Third avenue, New York, N. Y.
- Lahme, Charles A., No. 428 Main street, Kansas City, Mo.
- Lambert, John A., No. 450 West Michigan street, Indianapolis, Ind.
- Lammert, C. Joseph, Fourth and Smith streets, Cincinnati, O.
- Lancaster, Edwin W., Public Square, Marshall, Texas.
- Land, Robert H., No. 270 Broad street, Augusta, Ga.
- Lander, John C., Yorkville, Toronto, Can.
- Latimer, Robert F., Jackson, Mich.
- Lauer, Michael J., No. 275 Mulberry street, Baltimore, Md.
- Laurent, Eugene L., No. 27 Cedar street, Nashville, Tenn.
- Lautenbach, Robert, Eutaw and Saratoga streets, Baltimore, Md.
- Lavigne, Jean B., No. 265 North Poydras street, New Orleans, La.
- Lawrence, John H., Main and First streets, North Andover, Mass.
- Lawton, Charles H., No. 91 Union street, New Bedford, Mass.
- Lawton, Horace A., No. 91 Union street, New Bedford, Mass.
- Lazell, Lewis T., Nos. 90-94 Maiden Lane, New York, N. Y.
- Lee, Addison S., No. 14 Fayetteville street, Raleigh, N. C.
- Lee, James A., Main street, New Iberia, La.
- Lehn, Louis, No. 45 Strong Place, Brooklyn, N. Y.
- Lehr, Philip, No. 1145 Lorain street, Cleveland, Ohio.
- Leis, George, No. 90 Massachusetts street, Lawrence, Kan.
- Leist, Jacob L., Peru, Indiana.
- Leitch, Arthur, care of E. Shendell, St. Louis, Mo.
- Leith, Harvey I., No. 282 North Main street, Providence, R. I.
- Lemberger, Joseph L., No. 5 North Ninth street, Lebanon, Pa.

- Lengfeld, Abraham L., Geary and Stockton streets, San Francisco, Cal.
- Levy, Adolph, No. 125 Grand street, E. D., Brooklyn, N. Y.
- Lewis, Benjamin, No. 21 Canal street, New Orleans, La.
- Lewis, Elam C., No. 2 West cor. Merchants' Row, Rutland, Vt.
- Lewis, Samuel E., Fourteenth and P streets, N. W., Washington, D. C.
- Libby, Henry T., Main street, Pittsfield, Me.
- Lillie, Charles H., Main street, Great Barrington, Mass.
- Lilly, Eli, No. 36 South Meridian street, Indianapolis, Ind.
- Lincoln, Henry W.*, City Square, Charlestown, Mass.
- Linden, Hugo F., Superior and Broad streets, Cleveland, Ohio.
- Livingston, Barent V. B., No. 306 Broadway, Brooklyn, N. Y.
- Llewellyn, John F., west side Public Square, Mexico, Adrian county, Mo.
- Lloyd, John U., Court and Plum streets, Cincinnati, O.
- Lockhart, George B., Thirty-second and O streets, West Washington, D. C.
- Lockwood, Samuel A., Broad and White streets, Red Bank, Monmouth county, N. J.
- Lohman, George H., No. 1 Mitchell's Block, Kendallville, Ind.
- Loomis, John C., Chestnut and Wall streets, Jeffersonville, Ind.
- Lord, Thomas, No. 72 Wabash avenue, Chicago, Ill.
- Love, Charles E., No. 544 Main street, Kansas City, Mo.
- Loveland, William F., No. 213 Bread street, Elizabeth, N. J.
- Lowd, John C., No. 43 Temple Place, Boston, Mass.
- Lowden, John, No. 18 De Breseles street, Toronto, Can.
- Ludlow, Charles, No. 55 East Main street, Springfield, O.
- Luhn, Gustavus J., P. O. Box 582, Charleston, S. C.
- Luscomb, William E., No. 289 Essex street, Salem, Mass.
- Lyman, Asahel H., No. 101 West River street, Manistee, Mich.
- Lynn, Winfield S., Indianapolis, Ind.
- Lyons, Albert B., No. 423 Second street, Detroit, Mich.
- Lyons, Isaac L., Nos. 42 and 44 Camp street, New Orleans, La.
- McCaffrey, James, No. 274 Main street, Cambridge City, Wayne county, Ind.
- McCarthy, Cornelius J., Main and Centre streets, Shenandoah, Schuylkill county, Pa.
- McClure, Archibald, Nos. 74 and 76 State street, Albany, N. Y.
- McClure, William H., Nos. 74 and 76 State street, Albany, N. Y.
- McConville, Thomas A.*, Macon, Ga.
- McDonald, George, Main and Burdick streets, Kalamazoo, Mich.
- McElhenie, Thomas D., No. 259 Ryerson street, Brooklyn, N. Y.
- McIntyre, Byron F., No. 99 North Moore street, New York, N. Y.
- McIntyre, Ewen, No. 874 Broadway, New York, N. Y.
- McIntyre, William, No. 2229 Frankford avenue, Philadelphia, Pa.
- McKelway, George I., No. 1410 Chestnut street, Philadelphia, Pa.
- McKenney, Jesse F., Shelbyville, Ky.
- McKesson, John, Jr., No. 91 Fulton street, New York, N. Y.
- McLeod, Roderick, Quebec, Can.
- McLelland, Robert C., Main street, Bryan, Texas.
- McNeil, John M., Broadway, Scottdale, Westmoreland county, Pa.
- McPherson, George, Chicago, Ill.
- Macdonald, Daniel T., Red Jacket, Haughton county, Mich.
- Mack, Adolph, No. 11 Front street, San Francisco, Cal.
- MacKimmie, George D., Detroit, Mich.
- Maclagan, Henry, No. 91 Fulton street, New York, N. Y.
- Macmahan, Thomas J., No. 142 Sixth avenue, New York, N. Y.
- Main, Thomas F., No. 278 Greenwich street, New York, N. Y.
- Maisch, Henry C. C., No. 6 Papendiek, Göttingen, Germany.
- MAISCH, JOHN M., No. 143 North Tenth street, Philadelphia, Pa.

- Major, John R., No. 800 Seventh street, Washington, D. C.
- Major, Oscar, No. 400 South Second street, Clinton, Ia.
- Mallinckrodt, Edward, Mallinckrodt and Main streets, St. Louis, Mo.
- Mangold, Gustavus A., No. 4 East State street, Trenton, N. J.
- Markoe, George F. H., Warren and Dudley streets, Boston, Mass.
- Marquardt, Jacob F., No. 60 Washington street, Tiffin, O.
- Marshall, Ernest C., No. 51 Vine street, Charlestown, Mass.
- Marsteller, George L., No. 231 King street, Charleston, S. C.
- Martin, Charles C., No. 21 High street, Cloverport, Ky.
- Martin, Emil, Russell avenue and South Meridian street, Indianapolis, Ind.
- Martin, Hugo W. C., Chicago, Ill.
- Martin, John C., U. S. Naval Dispensary, Washington, D. C.
- Martin, William J., Seventh and Elm streets, Cincinnati, O.
- Masi, Frederick H., Main and Granby streets, Norfolk, Va.
- Mason, Alfred H., No. 41 St. John Baptiste street, Montreal, Canada.
- Mason, Norman, No. 129 North Main street, Providence, R. I.
- Massey, William M., No. 1129 Broadway, New York, N. Y.
- Masters, Robert S., Main street, Kentville, Nova Scotia.
- Mattison, Richard V., No. 9 North Fifth street, Philadelphia, Pa.
- May, Arthur F., No. 227 Garden street, Cleveland, O.
- May, James O., Water street, Naugatuck, Conn.
- Mayell, Alfred, Euclid avenue and Erie street, Cleveland, O.
- Maynard, Henry S., No. 626 West Lake street, Chicago, Ill.
- Mehring, Joseph A., North Main street, Jasper, Dubois county, Ind.
- Meininger, Albert, Vine and Twelfth streets, Cincinnati, O.
- Melchers, Henry, Genesee and Jefferson streets, East Saginaw, Mich.
- Mellon, John J., No. 42 Camp street, New Orleans, La.
- Mellor, Alfred*, No. 218 North Twenty-second street, Philadelphia, Pa.
- Melvin, J. Lacy, Dodge City, Kan.
- Melvin, James S.*, No. 43 Temple Place, Boston, Mass.
- Menard, Robert P., No. 63 Central avenue, Hot Springs, Ark.
- Menkemeller, Charles, Twenty-second and Market streets, Wheeling, W. Va.
- Menninger, Henry J., No. 97 Sands street, Brooklyn, N. Y.
- Merrell, Ashbel H., No. 194 Kansas avenue, Topeka, Kan.
- Merrell, George, No. 5 West Fifth street, Cincinnati, O.
- Metcalf, Theodore*, No. 39 Tremont street, Boston, Mass.
- Meyer, Christian F. G., No. 8 North Second street, St. Louis, Mo.
- Meyers, James A., Odd Fellows' Hall, Columbia, Pa.
- Michaelis, Charles O., King and Cannon streets, Charleston, S. C.
- Michaelis, Gustavus, No. 1 Myrtle avenue, Albany, N. Y.
- Milburn, John A., No. 1429 Pennsylvania avenue, N. W., Washington, D. C.
- Milburn, Washington C., No. 1429 Pennsylvania avenue, N. W., Washington, D. C.
- Milbau, Edward L., No. 183 Broadway, New York, N. Y.
- Miller, Adolphus W., Third and Callowhill streets, Philadelphia, Pa.
- Miller, Charles E., Illinois and Market streets, Indianapolis, Ind.
- Miller, George Y., No. 2 River street, Luzerne, Warren county, N. Y.
- Miller, Jacob A., Second and Chestnut streets, Harrisburg, Pa.
- Miller, Jason A., No. 115 Main street, Gloversville, N. Y.
- Miller, Joseph G., No. 10 East Front street, Plainfield, N. J.
- Miller, Otho F. F., Plymouth street, Bremen, Ind.
- Miller, Robert McCleerty, Malone, N. Y.
- Milligan, Decatur, No. 509 North Second street, Philadelphia, Pa.
- Milliner, William T., Union street, Spencerport, N. Y.

- Miner, Maurice A., Wisconsin street, Geneva, Wis.
- Mingay, James, No. 472 Broadway, Saratoga Springs, N. Y.
- Miville, Francis C., No. 1023 Elm street, Manchester, N. H.
- Moffit, Thomas S.*, Nos. 309 and 311 Front street, San Francisco, Cal.
- Mohr, Charles, No. 177 Dauphin street, Mobile, Ala.
- Moith, Augustus T.*, No. 1 Ferry street, Fishkill, N. Y.
- Molwitz, Ernest*, No. 966 Sixth avenue, New York, N. Y.
- Monsarrat, Oscar, No. 113 South Broadway, Baltimore, Md.
- Montgomery, Melvin, Main and Dunkirk streets, Silver Creek, Chautauqua county, N. Y.
- Moody, Richard H., Main and High streets, Belfast, Maine.
- Moore, George, No. 26 Market street, Somersworth, N. H.
- Moore, J. Faris*, Howard and Madison streets, Baltimore, Md.
- Moore, James P., No. 62 Lake street, Chicago, Ill.
- Moore, James S., Main street, West Stockbridge, Berkshire county, Mass.
- Moore, Joachim B., Thirteenth and Lombard streets, Philadelphia, Pa.
- Moore, Silas H., No. 80 Fourth street, Sioux City, Iowa.
- Moore, Thomas F., No. 21 Canal street, New Orleans, La.
- Moorhead, William W., Broad and South streets, Philadelphia, Pa.
- More, Arthur J., No. 80 Fourth street, Sioux City, Iowa.
- Morgan, Benjamin G., Main and Jackson streets, Hyde Park, Pa.
- Morgan, James*, Carl Junction, Mo.
- Morgan, Richard E., No. 135 High street, Holyoke, Mass.
- Morley, William J., No. 100 South Second street, St. Louis, Mo.
- Morrell, Mary H., Main street, Winterport, Me.
- Morrill, Benjamin, Blue Hill, Me.
- Morris, Lemuel I., Emporia, Kan.
- Morrison, Thomas O., No. 262 Eighth avenue, New York, N. Y.
- Mott, George F., Main street, Catskill, Greene county, N. Y.
- Mowry, Albert D., No. 365 Warren street, Boston, Mass.
- Mueller, Adolphus, Cherry street, Highland, Ill.
- Mueller, Louis H., No. 249 East Washington street, Indianapolis, Ind.
- Munds, James C., Statesville, N. C.
- Munger, John F., No. 361 Broadway, East Greenbush, Rensselaer county, N. Y.
- Munson, Luzerne J., Apothecaries' Hall, Waterbury, Conn.
- Murray, Bernard J., No. 3356 Ridge avenue, Philadelphia, Pa.
- Murray, Francis M., No. 1015 Columbia avenue, Philadelphia, Pa.
- Murray, Talbot C., No. 513 Second street, N. W., Washington, D. C.
- Musler, Abram, Main street, Orange, N. J.
- Myers, Daniel, Cleveland, O.
- Nattans, Arthur, Second and D streets, N. W., Washington, D. C.
- Neergaard, Sidney H., No. 1183 Broadway, New York, N. Y.
- Newbold, Thomas M., No. 4060 Chestnut street, Philadelphia, Pa.
- Newman, Alcuin E., Central avenue, Hot Springs, Ark.
- Newman, George A., Fifth and Walnut streets, Louisville, Ky.
- Newman, George A.*, No. 380 Myrtle avenue, Brooklyn, N. Y.
- Nicholas, William C., No. 25 Putnam avenue, Brooklyn, N. Y.
- Nichols, John C., No. 55 State street, New London, Conn.
- Nichols, Thomas B., No. 159½ Essex street, Salem, Mass.
- Nick, Frederick, No. 1726 Peach street, Erie, Pa.
- Nicot, Louis E., No. 65 Union avenue, Brooklyn, N. Y.
- Niebrugge, John A.*, No. 506 Bedford avenue, Brooklyn, N. Y.
- Nipgen, John A., Paint and Second streets, Chillicothe, O.
- Nisbet, William W., Washington avenue, Pittsburgh, Pa.
- Noble, John J., Centre and Pelham streets, Newton Centre, Mass.

- Oatman, Le Roy S., No. 5 Commercial street, Angola, Erie county, N. Y.
- O'Brien, James J., No. 53 Kneeland street, Boston, Mass.
- O'Neil, Henry M., No. 463 Hudson street, New York, N. Y.
- Ohliger, Lewis P., No. 23 West Liberty street, Wooster, O.
- Oldberg, Oscar, No. 465 State street, Chicago, Ill.
- Oleson, Olaf M., No. 1307 Farnam street, Omaha, Neb.
- Oliver, William M., No. 32 Broad street, Elizabeth, N. J.
- Ollif, James H.*, No. 855 Fulton street, Brooklyn, N. Y.
- Orne, Charles P., No. 837 Main street, Cambridgeport, Mass.
- Orne, Joel S., No. 493 Main street, Cambridgeport, Mass.
- Osann, Bernard, No. 107 Fourth avenue, New York, N. Y.
- Osgood, Hugh H., No. 148 Main street, Norwich, Conn.
- Osmun, Charles A., No. 13 Seventh avenue, New York, N. Y.
- Otis, Clark Z., No. 84 Court street, Binghamton, N. Y.
- Ottinger, James J., Twentieth and Spruce streets, Philadelphia, Pa.
- Otto, Charles H., No. 137 Prince street, New York, N. Y.
- Owens, James A., No. 45 Dominick street, Rome, N. Y.
- Owens, Richard J., Myrtle and Spencer streets, Brooklyn, N. Y.
- Paine, James D.*, No. 24 East Main street, Rochester, N. Y.
- Paine, Milton K., Main and State streets, Windsor, Vt.
- Painter, Emlen, Broadway and Thirty-fourth street, New York, N. Y.
- Panknin, Charles F., No. 123 Meeting street, Charleston, S. C.
- Parcher, George A., Main street, Ellsworth, Me.
- Parker, George H., Draper's Block, Main street, Andover, Mass.
- Parker, John H., No. 63 West Main street, Meriden, Conn.
- Parr, John C.*, Main street, Weston, Mo.
- Parsons, John, No. 684 Wabash avenue, Chicago, Ill.
- Parsons, Richard, No. 182 Ontario street, Cleveland, O.
- Parsons, Robert E., No. 19 Main street, Orange, N. J.
- Partridge, Charles K., Granite Block, Augusta, Me.
- Patch, Edgar L., No. 109 Green street, Boston, Mass.
- Patten, I. Bartlett*, No. 39 Harrison avenue, Boston, Mass.
- Patton, John Franklin, No. 237 West Market street, York, Pa.
- Patterson, James L., Twenty-first street and Ridge avenue, Philadelphia, Pa.
- Patterson, Theodore H., No. 3644 Cottage Grove avenue, Chicago, Ill.
- Pauley, Frank C., Eastern street and Compton avenue, St. Louis, Mo.
- Peabody, William H.*, No. 8 South Division street, Buffalo, N. Y.
- Pease, Francis M., Main street, Lee, Mass.
- Peck, George L., Hall of Pharmacy, Jamaica, N. Y.
- Peixotto, Moses L. M., No. 543 Fifth avenue, New York, N. Y.
- Penfold, Henry J., No. 5 Commercial street, Angola, Erie county, N. Y.
- Pennington, T. H. Sands, No. 400 Broadway, Saratoga, N. Y.
- Perkins, Benjamin A., Nos. 74 and 76 Commercial street, Portland, Me.
- Perkins, Elisha H.*, Green and Baltimore streets, Baltimore, Md.
- Perkins, William A., No. 84 South C street, Virginia City, Nev.
- Perot, T. Morris*, No. 1810 Pine street, Philadelphia, Pa.
- Perry, Bayard T., No. 1088 Elm street, Manchester, N. H.
- Perry, Frederick W. R., Detroit, Mich.
- Pettengill, Edward T., No. 1713 New York avenue, Washington, D. C.
- Pettit, Henry M., Carrollton, Mo.
- Pfingst, Edward C., Third and Brecklenridge streets, Louisville, Ky.
- PFINGST, FERDINAND J., Eighteenth and Main streets, Louisville, Ky.
- Pfingst, Henry A., Eleventh and Market streets, Louisville, Ky.

- Pfingsten, Gustavus, No. 6 Whitehall street,
 New York, N. Y.
 Phelps, Dwight, No. 337 Main street, West
 Winsted, Conn.
 Phillips, Charles W., No. 484 Eastern ave-
 nue, Cincinnati, O.
 Physic, Henry S., No. 905 Clay avenue, St.
 Louis, Mo.
 Pierce, Frank W., Main street, Chester, Vt.
 Pierce, William H., No. 1067 Washington
 street, Boston, Mass.
 Pile, Gustavus, No. 770 Passyunk avenue,
 Philadelphia, Pa.
 Pilsbury, Frank O., Walpole, Mass.
 Pinkham, Alonzo T., Franklin Square,
 Dover, N. H.
 Pitt, John R., Jr., No. 218 Main street,
 Middletown, Conn.
 Plautz, C. Herman, No. 709 Milwaukee
 avenue, Chicago, Ill.
 Plummer, David G., No. 6 Main street,
 Bradford, Stark county, Ill.
 Plummer, William P., No. 6 Main street,
 Bradford, Stark county, Ill.
 Poley, Francis H., No. 8 West Main street,
 Norristown, Pa.
 Pollard, Frank W., Central avenue, Hot
 Springs, Ark.
 Porter, Chelton S., Eminence, Ky.
 Porter, Henry C., Main and Pine streets,
 Towanda, Pa.
 Porter, W. C., Greensboro, N. C.
 Post, Elisha, Main and Pine streets, Athens,
 N. Y.
 Potterfield, Clarence A., Charleston, Kana-
 wha county, W. Va.
 Powell, Robert B., Second and G streets,
 Eureka, Humboldt Bay, Cal.
 Powell, Thomas W., No. 10 Houston street,
 Fort Worth, Tex.
 Power, Frederick B., University of Wis-
 consin, Madison, Wis.
 Prall, Delbert E., No. 111 Jefferson ave-
 nue, East Saginaw, Mich.
 Prentice, Fred F., opposite Post Office,
 Janesville, Wis.
 Prescott, Albert B., University of Michigan,
 Ann Arbor, Mich.
 Prescott, Horace A., No. 360 Washington
 street, Boston, Mass.
 Preston, Andrew P., No. 2 Congress Block,
 Portsmouth, N. H.
 Preston, Calvin W., No. 175 Market street,
 Galveston, Tex.
 Preston, David, Ninth and Lombard streets,
 Philadelphia, Pa.
 Preuss, Edward A., No. 21 Spring street,
 Los Angeles, Cal.
 Price, Charles H., No. 226 Essex street,
 Salem, Mass.
 Priddy, Robert S., No. 19 Sandwich street,
 Windsor, Ontario, Canada.
 Prieson, Adolph, Main and Desper streets,
 Lock Haven, Pa.
 Pritchard, Benjamin, E., No. 223 Fifth ave-
 nue, McKeesport, Pa.
 Procter, Wallace, Ninth and Lombard
 streets, Philadelphia, Pa.
 Punch, William F., No. 71 Dauphin street,
 Mobile, Ala.
 Purcell, John B., No. 1216 East Main street,
 Richmond, Va.
 Pursell, Howard, Mill and Cedar streets,
 Bristol, Pa.
 Pyle, Cyrus, No. 326 Fulton street, Brook-
 lyn, N. Y.
 Quackinbush, Benjamin F., 703 Greenwich
 street, New York, N. Y.
 Rackley, Benjamin F., Franklin Square and
 Charles street, Dover, N. H.
 Rademaker, Herman H., Madison and
 Shelby streets, Louisville, Ky.
 Ramsperger, Gustavus, No. 703 Fulton
 street, Brooklyn, N. Y.
 Randall, George D., Railroad street, St.
 Johnsbury, Vt.
 Rankin, Jesse W., Decatur and Pryor streets,
 Atlanta, Ga.
 Rano, Charles O., No. 1872 Niagara street,
 Buffalo, N. Y.
 Rapelye, Charles A., No. 605 Main street,
 Hartford, Conn.
 Raser, John B., No. 164 North Eighth
 street, Reading, Pa.
 Redsecker, Jacob B., No. 810 Cumberland
 street, Lebanon, Pa.
 Reed, Isaac N., No. 139 Summit street,
 Toledo, O.
 Reichardt, F. Alfred, No. 45 Maiden Lane,
 New York, N. Y.
 Reinhold, William, No. 146 North Clark
 street, Chicago, Ill.
 Reinlein, Paul, Washington, D. C.

- Reiss, Edward C., No. 997 Broadway, Brooklyn, N. Y.
- REMINGTON, JOSEPH P., No. 1832 Pine street, Philadelphia, Pa.
- Rendigs, Charles P., Spring and Abigail streets, Cincinnati, O.
- Renouff, James T., Main street, Winsted, Conn.
- Renz, Frederick J., Market and Floyd streets, Louisville, Ky.
- estieaux, Thomas, No. 29 Tremont street, Boston, Mass.
- Reum, Hermann F., Fifth and Broadway, Cincinnati, O.
- Reusch, Ernst, No. 164 Nevin street, Brooklyn, N. Y.
- Reynolds, Charles E., U. S. Receiving Ship Vermont, Brooklyn, N. Y.
- Reynolds, Howard P., Front and Cherry streets, Plainfield, N. J.
- Reynolds, John J., Water and Main Cross streets, Flemingsburg, Ky.
- Reynolds, William K., No. 254 Friendship street, Providence, R. I.
- Rhoades, Stephen H., No. 88 Main street, Pittston, Pa.
- Rice, Charles, Bellevue Hospital, N. Y.
- Rich, Willis S., Sand Bank, N. Y.
- Richardson, Frank, Hudson, N. Y.
- Richardson, James, No. 2827 Locust street, St. Louis, Mo.
- Richardson, J. Clifford, No. 704 North Main street, St. Louis, Mo.
- Rickey, Charles T., Mount Sterling, Ill.
- Rickey, Randal, No. 157 North Green street, Trenton, N. J.
- Ricksecker, Theodore, No. 146 William street, New York, N. Y.
- Riddell, James A., Second near Main streets, Aurora, Ind.
- Ridgway, Lemuel A., No. 224 Sullivan street, Mansfield, Tioga county, Pa.
- Riesenman, Joseph, Liberty street, Franklin, Pa.
- Riley, Charles W., No. 1115 Race street, Philadelphia, Pa.
- Risk, Clarence H., Charles and Read streets, Baltimore, Md.
- Rittenhouse, Henry N.*, No. 218 North Twenty-second street, Philadelphia, Pa.
- Robbins, Alonzo, Eleventh and Vine streets, Philadelphia, Pa.
- Robbins, Charles A., No. 91 Fulton street, New York, N. Y.
- Robbins, Daniel C., No. 91 Fulton street, New York, N. Y.
- Robert, Daniel J., Peabody, Kan.
- Roberts, Joseph*, No. 1 Greenmount avenue, Baltimore, Md.
- Robertson, Archibald C., 101 Wood street, Pittsburg, Pa.
- Robinson, James S., Second and Madison streets, Memphis, Tenn.
- Robinson, William S., Yorkville, Toronto, Ont., Can.
- Roche, Edward M., No. 611 South Fifteenth street, Philadelphia, Pa.
- Rockefeller, Lucius, Palisade avenue, Englewood, N. J.
- Rogers, Arthur H., Geneseo, N. Y.
- Rogers, Wiley, Fifteenth and Chestnut streets, Louisville, Ky.
- Rogers, William H., North street, Middletown, N. Y.
- Rhode, Claus F., Spring Valley, Minn.
- Rollins, John F.*, Fort George, Fla.
- Rolph, Charles W., No. 69 Main street, Cuba, N. Y.
- Rommel, Emanuel, Lockport, N. Y.
- Ronnefeld, Theodore, No. 195 Gratiot street, Detroit, Mich.
- Rose, Henry J., California.
- Rosengarten, Mitchell G., Seventeenth and Fitzwater streets, Philadelphia, Pa.
- Rosenwasser, Nathan, No. 112 Superior street, Cleveland, O.
- Ross, Ellison H., Adrian, Mich.
- Roth, Eugene N., Market street, between Green and St. Louis streets, Thibodeaux, La.
- Royce, Lucien M., No. 278 Greenwich street, New York, N. Y.
- Ruete, Theodore W., No. 379 Main street, Dubuque, Iowa.
- Rumsey, Samuel L., No. 423 Main street, East Orange, N. J.
- Runyon, Edward W., No. 529 Market street, San Francisco, Cal.
- Ruppert, John, Fifth and Smith streets, Cincinnati, O.
- Russell, Edward W., Baltimore and Eutaw streets, Baltimore, Md.
- Russell, Elias S., No. 69 Main street, Nashua, N. H.

- Russell, Eugene J.*, Army street and Canton avenue, Baltimore, Md.
- Rust, William*, No. 7 Peace street, New Brunswick, N. J.
- Ryerson, Henry O.*, No. 5 Main street, Newton, N. J.
- Safford, William B.*, Vance and Hernando streets, Memphis, Tenn.
- Sander, Fno*, Nineteenth and South Eleventh streets, St. Louis, Mo.
- Sanderson, Stephen Francis*, Rochester, N. Y.
- Sands, George G.*, No. 4 Vanderbilt avenue, New York, N. Y.
- Sappington, Richard*, No. 131 North Gay street, Baltimore, Md.
- Sargent, Ezekiel H.*, No. 125 State street, Chicago, Ill.
- Sauer, Louis W.*, Central avenue and Baymiller street, Cincinnati, O.
- Sauerhering, Rudolph A.*, Main street, Mayville, Dodge county, Wis.
- Saunders, Richard B.*, Chapel Hill, N. C.
- Saunders, William*, London, Ontario, Can.
- Sautter, Louis*, South Pearl and Plain streets, Albany, N. Y.
- Savage, Thomas J.*, Mobile, Ala.
- Sawyer, William F.*, 1152 Tremont street, Boston, Mass.
- Sayre, Edward A.*, No. 183 Littleton avenue, Newark, N. J.
- Sayre, Lucius E.*, University of Kansas, Lawrence, Kan.
- Sayre, William H.*, Warner and Orange streets, Newark, N. J.
- Schaaf, Justus H.*, No. 442 Second street, Gallipolis, O.
- Schafer, George H.*, No. 129 Front street, Fort Madison, Iowa.
- Schaffle, Samuel W. W.*, Market street, Lewisburg, Pa.
- Schafhirt, Adolph J.*, First and H streets, Washington, D. C.
- Schamps, George M.*, Park Pharmacy, Cleveland, O.
- Scheffer, Emil*, No. 145 Market street, Louisville, Ky.
- Scheffer, Henry W.*, No. 218 Clark avenue, St. Louis, Mo.
- Schellentrager, E. A.*, No. 725 St. Clair street, Cleveland, O.
- Scherer, Andrew*, No. 381 East Division street, Chicago, Ill.
- Scherff, John P.*, Glenwood avenue and Washington street, Bloomfield, N. J.
- Scherling, Gustav*, Sioux City, Ia.
- Schermerhorn, Winfield S.*, Main street, Stillwater, Saratoga county, N. Y.
- Schiemann, Edward B.*, M. and Walnut streets, Louisville, Ky.
- Schlaepfer, Henry J.*, Main and Second streets, Evansville, Ind.
- Schley, Steiner*, No. 16 West Patrick street, Frederick City, Md.
- Schmid, Henry*, No. 38 avenue A, New York, N. Y.
- Schmidt, Florian C.*, Fulton avenue and Franklin street, Evansville, Ind.
- Schmitt, Joseph M.*, No. 312 North avenue, Rochester, N. Y.
- Schneider, Matthias M.*, No. 327 Carson street, Pittsburg, Pa.
- Schoettlin, Albert J.*, No. 301 West Broadway, Louisville, Ky.
- Scholtz, Edmund I.*, Sixteenth and Stout streets, Denver, Col.
- Schrader, Henry*, No. 74 East Washington street, Indianapolis, Ind.
- Schranck, C. Henry*, Nos. 437 and 439 East Water street, Milwaukee, Wis.
- Schreck, Leo S.*, Liberty and John streets, Cincinnati, O.
- Schreiber, August*, Odd Fellows' Hall, Eighth street, Tell City, Ind.
- Schroeder, Hermann*, No. 525 Main street, Quincy, Ill.
- Schueller, Ernst*, No. 231 South High street, Columbus, O.
- Schueller, Frederick W.*, Nos. 190 and 192 South High street, Columbus, O.
- Schuerman, Frederick*, Fifth and Plum streets, Cincinnati, O.
- Schumann, Peter J.*, 186 Main street, Breckenridge, Col.
- Schumann, Theodore*, Whitehall and Hunter streets, Atlanta, Ga.
- Schwartz, John C.*, Hamilton, O.
- Schofield, James S.*, Ninth avenue and Fifty-seventh street, New York, N. Y.
- Scott, Geo. T.*, Franklin Square, Worcester, Mass.
- Scott, Nelson R.*, Main and Southbridge streets, Worcester, Mass.
- Scott, William H.*, No. 1617 Seventeenth street, Richmond, Va.

- Scott, William J., No. 257 Prospect street, Cleveland, O.
- Scoville, Charles H., 3 South Canal street, Tonowanda, Erie county, N. Y.
- Seabury, George J., No. 21 Platt street, New York, N. Y.
- Searby, William M., No. 859 Market street, San Francisco, Cal.
- Sechler, James C., No. 201 Mill street, Danville, Pa.
- Sedberry, Bond E., Market Square, Fayetteville, N. C.
- Seitz, Oscar, No. 107 Santa Fe ave., Salina, Kan.
- Senior, Frederick S., No. 1164 Humboldt avenue, Milwaukee, Wis.
- Sennewald, Ferdinand W., No. 800 Hickory street, St. Louis, Mo.
- Serodino, Herman, 53 Observatory street, Cincinnati, O.
- Sevin, N. Douglas, No. 141 Main street, Norwich, Conn.
- Sewall, David J., 1439 Dorchester avenue, Boston, Mass.
- Sharp, Alpheus P.*, Pratt and Howard sts., Baltimore, Md.
- Sharples, Stephen P., No. 13 Broad street, Boston, Mass.
- Shaw, Robert J., No. 3 East Front street, Plainfield, N. J.
- Shead, Edward E., No. 8 Water street, Eastport, Me.
- Shearer, Edward Y., No. 1103 Second avenue, New York, N. Y.
- Shedd, Edwin W., No. 39 Tremont street, Boston, Mass.
- Sheils, George E., No. 896 Broadway, New York, N. Y.
- SHEPPARD, SAMUEL A. D., No. 1129 Washington street, Boston, Mass.
- Sherwood, Louis W., No. 31 West Broad street, Columbus, O.
- Shinn, James T., Broad and Spruce streets, Philadelphia, Pa.
- Shivers, Charles, Seventh and Spruce sts., Philadelphia, Pa.
- Shoemaker, Richard M., Fourth and Race streets, Philadelphia, Pa.
- Short, J. Eagan, U. S. Naval Dispensary, Washington, D. C.
- Shrader, John L., Michigan City, Ind.
- Shreve, John A., Main street, Port Gibson, Miss.
- Shriver, Henry, No. 53 Baltimore street, Cumberland, Md.
- Shryer, Thomas W., No. 103 Baltimore street, Cumberland, Md.
- Shryock, Allen, No. 1129 Mount Vernon street, Philadelphia, Pa.
- Shurtleff, Israel H., No. 39 Elm street, New Bedford, Mass.
- Siegemund, Charles A., No. 1553 Washington street, Boston, Mass.
- Siegenthaler, Harvey N., No. 55 East Main street, Springfield, O.
- Simmon, Karl, Third and Market streets, St. Paul, Minn.
- Simms, Giles G. C., No. 1344 New York avenue, Washington, D. C.
- Simon, William, 10 Block street, Baltimore, Md.
- Simpson, William, No. 33 Fayetteville st., Raleigh, N. C.
- Simpson, William, No. 609 Davis street, San Francisco, Cal.
- Simson, Francis C., care of Brown & Webb, Halifax, N. S.
- Sitton, Charles E., No. 151 First street, Portland, Oregon.
- Skelly, James T., No. 339 East Fourteenth street, New York, N. Y.
- Slater, Frank H., Main street, Mattawan, Monmouth county, N. J.
- Sloan, George W., No. 304 North Meridian street, Indianapolis, Ind.
- Slocum, Frank L., O'Hara street, Pittsburgh, Pa.
- Slosson, Frank W., No. 223 Superior street, Cleveland, O.
- Slosson, George, Coffeyville, Kan.
- Smalley, Elijah, No. 35 Emerald street, Boston, Mass.
- Smink, William H. R., 33 Market street, Shamokin, Pa.
- Smith, Charles B., No. 861 Broad street, Newark, N. J.
- Smith, Edward N., No. 95 Main street, Thompsonville, Hartford county, Conn.
- Smith, Israel P., No. 324 Bank street, Newark, N. J.
- Smith, J. Hungerford, firm Smith & Prince, Au Sable Forks, N. Y.

- Smith, Joseph S., No. 193 S. Howard Street, Akron, O.
- Smith, Linton, Seventh and Market streets, Wilmington, Del.
- Smith, S. Douglas, No. 526 Penn street, Reading, Pa.
- Smith, Willard, No. 20 W. Main street, Rochester, N. Y.
- Smith, Willard A., Main street, Richfield Springs, N. Y.
- Smithnight, Albert, No. 135 Woodland avenue, Cleveland, O.
- Sniteman, Charles C., Neillsville, Wis.
- Snively, Andrew J., Centre Square, Hanover, York county, Pa.
- Snow, Charles W., No. 28 East Genesee street, Syracuse, N. Y.
- Snow, Jesse W., Merrimac and Friend streets, Boston, Mass.
- Snyder, Alva L., No. 33 Court Square, Bryan, O.
- Snyder, Ambrose C.*, No. 13½ St. Felix street, Brooklyn, N. Y.
- Sombart, John E., Coldwater, Kan.
- Somers, Frank G., No. 125 State street, Chicago, Ill.
- Somers, Richard M., Fifteenth and Oxford streets, Philadelphia, Pa.
- Spalding, Warren A., No. 19 Church street, New Haven, Conn.
- Spannagel, Charles C., No. 1607 Ridge avenue, Philadelphia, Pa.
- Spencer, Peter I., No. 88 Garden street, Cleveland, O.
- Sperry, Herman J., No. 151 Chapel street, New Haven, Conn.
- Spieth, William F., No. 273 Woodland avenue, Cleveland, O.
- Spofford, Charles B., No. 12 Tremont street, Claremont, N. H.
- Squibb, Edward H., No. 36 Doughty street, Brooklyn, N. Y.
- Squibb, Edward R., No. 36 Doughty street, Brooklyn, N. Y.
- Stacey, Benjamin F., Thompson Square, Charlestown, Mass.
- Stahler, William, Main and Swedes streets, Norristown, Pa.
- Staley, Michael S., No. 444 Virginia ave., Indianapolis, Ind.
- Stam, Colin A., Chestertown, Md.
- Stamford, William H., No. 256 Mulberry street, Newark, N. J.
- Stanford, William A., No. 413 Main street, Florence, Kan.
- Stanley, E. C., No. 6 Beach avenue, Auburn, N. Y.
- Starr, Thomas, No. 313 Ninth avenue, New York, N. Y.
- Steele, Henry*, Turk and Taylor streets, San Francisco, Cal.
- Steele, James G., No. 635 Market street, San Francisco, Cal.
- Stein, Jacob H., No. 803 Penn street, Reading, Pa.
- Steinhauer, Frederick, No. 381 Lorimer street, Denver, Col.
- Stevens, Alonzo B., University of Michigan, Ann Arbor, Mich.
- Stevens, S. Henry, 627 Copeland street, Pittsburgh, Pa.
- Stevens, Luther F., Atlantic avenue and Court street, Brooklyn, N. Y.
- Stewart, Francis E., 721 South Twenty-second street, Philadelphia, Pa.
- Stierle, Adolph, No. 302 East Seventh street, St. Paul, Minn.
- Stone, Clarence G., 580 Lafayette avenue, Detroit, Mich.
- Stowell, Daniel, No. 1045 Washington street, Boston, Mass.
- Strachan, William E., No. 619 Third ave., Brooklyn, N. Y.
- Strassel, William, cor. Shelby and Broadway, Louisville, Ky.
- Stryker, Cornelius W., No. 1233 Walnut street, Philadelphia, Pa.
- Sturtevant, T. Frank, Front street, Dodge City, Kan.
- Sutton, Peter P., Floyd and Market streets, Louisville, Ky.
- Sweeny, Robert O.*, St. Paul, Minn.
- Sweet, Abel S., Jr., No. 2 Main street, Bangor, Me.
- Sweet, Caldwell, No. 22 W. Market street, Bangor, Me.
- Sweet, Frederick K., No. 2 Main street, Lockport, N. Y.
- Sweet, William S., No. 44 Main street, Warsaw, N. Y.
- Tartis, Alfred J., No. 268 Putnam avenue, Brooklyn, N. Y.

- Taylor, Alfred B.*, No. 262 South Twelfth street, Philadelphia, Pa.
- Taylor, James H.*, No. 104 Thames street, Newport, R. I.
- Taylor, John P.*, No. 99 Third street, New Bedford, Mass.
- Test, Alfred W.*, Second and Federal streets, Camden, N. J.
- Thatcher, Joseph H.*, No. 12 Market street, Portsmouth, N. H.
- Thatcher, Hervey D.*, No. 12 Market Square, Potsdam, N. Y.
- Thibodeaux, Joseph G.*, Main street, Thibodeaux, La.
- Thackeray, William T.*, 1201 Arlington avenue, Davenport, Ia.
- Thomas, George M.*, Derry Station, Pa.
- Thomas, James, Jr.*, opposite Maxwell House, Nashville, Tenn.
- Thomas, Oscar E.*, No. 123 Richardson street, Columbia, S. C.
- Thompson, Edward W.*, No. 181 Main street, New Britain, Conn.
- Thompson, William B.*, No. 1700 Mount Vernon street, Philadelphia, Pa.
- Thompson, William P.*, No. 5 West Baltimore street, Baltimore, Md.
- Thompson, William S.*, No. 703 Fifteenth street, Washington, D. C.
- Thompson, William S.*, No. 5 West Baltimore street, Baltimore, Md.
- Thomsen, John J.*, Nos. 14 and 16 German street, Baltimore, Md.
- Thomsen, John J., Jr.*, No. 18 McCulloh street, Baltimore, Md.
- Thorn, Henry P.*, Main street, Medford, N. J.
- Thornton, William E.*, Baltimore and Harrison streets, Baltimore, Md.
- Thorp, Abner*, Prospect Place, Avondale, O.
- Thurber, Almon R.*, No. 216 F street, Salida, Col.
- Thurston, Azor*, Grand Rapids, Wood county, O.
- Tiarks, Hermann*, First street, Monticello, Ia.
- Tibbs, William H.*, Grand Rapids, Mich.
- Tiernan, Frank M.*, Mansion House, Roselle, N. J.
- Tilyard, Charles S.*, Greene and Franklin streets, Baltimore, Md.
- Tindall, Graham McF.*, No. 61 Commercial street, Aberdeen, Miss.
- Tobey, Charles W.*, No. 302 Market street, Troy, O.
- Todd, Albert M.*, Nottowa, St. Joseph county, Mich.
- Todd, William J.*, No. 71 Franklin street, Pittsburgh, Pa.
- Tomfohrde, John W.*, Benton and West Eighteenth streets, St. Louis, Mo.
- Tooker, William W.*, No. 70 Main street, Sag Harbor, N. Y.
- Topley, James*, No. 166 Georgia street, Vallejo, Solano county, Cal.
- Toulson, Melbourn A.*, High street, Chestertown, Md.
- Tower, Levi, Jr.*, Boylston and Clarendon streets, Boston, Mass.
- Townley, William W.*, No. 765 Broad street, Newark, N. J.
- Townsend, Abram R.*, Marshalltown, Ia.
- Trask, Charles M.*, White River Junction, Vt.
- Treat, Joseph A.*, Stuart, Ia.
- Trimble, Henry*, No. 145 North Tenth street, Philadelphia, Pa.
- Truax, Charles*, No. 81 Randolph street, Chicago, Ill.
- Tscheppé, Adolph*, No. 1010 Third avenue, New York, N. Y.
- TUFTS, CHARLES A.*, No. 25 Washington street, Dover, N. H.
- Turner, George H.*, No. 296 South Pearl street, Albany, N. Y.
- Turner, Isaac W.*, No. 139 Wayne street, Jersey City, N. J.
- Turner, T. Iarkin*, No. 3 Ashburton Place, Boston, Mass.
- Tuska, David*, Second avenue and Eighty-sixth street, New York, N. Y.
- Twombly, John H.*, Masonic Block, Main street, New Market, N. H.
- Ubert, Julius C.*, Lee and Division streets, Brooklyn, N. Y.
- Ude, George*, No. 3610 N. Tenth street, St. Louis, Mo.
- Uhlich, Ferdinand G.*, No. 1401 Salisbury street, St. Louis, Mo.
- Underhill, George F.*, Main and School streets, Concord, N. H.
- Underhill, Joseph G.*, No. 397 Classon avenue, Brooklyn, N. Y.

- Urban, Jacob P., No. 336 Ontario street, Cleveland, O.
- Van Alstyne, Franklin B., No. 4 Broad street, Kinderhook, N. Y.
- Van Antwerp, Garet, No. 71 Dauphin street, Mobile, Ala.
- Van Auken, Jerrie A., No. 125 Main street, Gloversville, N. Y.
- Vandegrift, John A., No. 320 High street, Burlington, N. J.
- Van Patten, William J., College street, Burlington, Vt.
- Vansant, Robert H., No. 117 East State street, Trenton, N. J.
- Van Winkle, Abraham W., No. 35 Clinton avenue, Newark, N. J.
- Vaughan, Parry W., Main street, Durham, Orange county, N. C.
- Vaupel, Charles P., No. 58 Public Square, Cleveland, O.
- Vernor, James, No. 235 Woodward avenue, Detroit, Mich.
- Viallon, Paul L., Park and Front streets, Bayou Goula, La.
- Vickery, William H., Central and Orchard streets, Dover, N. H.
- Vilter, Herman, McMicken avenue and Locust street, Cincinnati, O.
- Vondick, August H., Jefferson avenue and Benton street, St. Louis, Mo.
- Voss, George W., Eighth and Depot streets, Cincinnati, O.
- Wackerbarth, John, Sands and Bridge streets, Brooklyn, N. Y.
- Wagner, Henry, Ninth and Linne streets, Cincinnati, O.
- Wahmboff, Julius H., No. 14 Canal street, Delphos, O.
- Walbrach, Arthur, No. 230 Fifteenth street, Denver, Col.
- Walch, Robert H., No. 1412 Walnut street, Philadelphia, Pa.
- Walker, Ansel, Main street, Freehold, N. J.
- Walker, Charles, No. 201 Third street, Hannibal, Mo.
- Walker, Francis W., Jr., New Brighton, Pa.
- Walker, George, Main street, Weir, Kan.
- Walker, John P., Main street, Freehold, N. J.
- Walker, William J., No. 74 State street, Albany, N. Y.
- Wall, Otto A., 2111 Columbus street, St. Louis, Mo.
- Walling, Walter A., No. 180 Charles street, Providence, R. I.
- Walton, Harry C., Laurel and Cutter streets, Cincinnati, O.
- Walton, Joseph, Washington, D. C.
- Wangler, Conrad D., Eastside, Waterloo, Ia.
- Wanier, George S., No. 407 Eighth avenue, New York, N. Y.
- Wardell, Robert C., Battle Creek, Mich.
- Warder, Robert B., Purdue University, Lafayette, Ind.
- Warn, William E., First street, Keyport, N. J.
- Warne, Henry L., Main street, Mitchell, Dak. Ter.
- Warner, William R., No. 1228 Market street, Philadelphia, Pa.
- Warren, Mrs. Ella F., Belleville, Richland county, O.
- Watjen, Herman J., Vincennes, Ind.
- Waugh, George J., Ontario street, Stratford, Ontario, Canada.
- Weaver, Charles A., Fifth and Walnut streets, Des Moines, Ia.
- Weaver, John A., No. 334 Northampton street, Easton, Pa.
- Webb, John A., No. 210 Madison avenue, Baltimore, Md.
- Webb, William H., No. 556 North Sixteenth street, Philadelphia, Pa.
- Webber, J. Le Roy, care of Parke, Davis & Co., Detroit, Mich.
- Webber, Joseph T., Main and State streets, Springfield, Mass.
- Weber, William, Fifteenth and Thompson streets, Philadelphia, Pa.
- Wehrly, Thomas M., No. 72 G street, N. W., Washington, D. C.
- Weichsel, Franz, No. 1 E. Main street, La Porte, Ind.
- Weidemann, Charles A., No. 2148 Green street, Philadelphia, Pa.
- Weills, William M. L., No. 332 Broad street, Harrisburg, Pa.
- Weinman, Oscar C., No. 173 Seventh avenue, New York, N. Y.
- Weiser, Albert, St. Paul and Main streets, St. Paul, Minn.
- Weiser, Emilius I., No. 5 Water street, Decorah, Ia.

- Welch, Leonard E., Broad and Washington streets, Albany, Ga.
- Wellcome, Henry S., No. 8 Snow Hill, London, England.
- Wellington, Arthur W., 190 Cranston street, Providence, R. I.
- Wells, Ebenezer M., Houston street, Fort Worth, Texas.
- Wells, Jacob D., Fourth street and Central avenue, Cincinnati, O.
- Wells, Romanta, No. 297 State street, New Haven, Conn.
- Wendell, Henry E., Third and George streets, Philadelphia, Pa.
- Wenzell, William T., No. 852 Market street, San Francisco, Cal.
- West, Howell F., Main street, Fayette, Miss.
- Westmann, F. H., No. 2744 Cass avenue, St. Louis, Mo.
- Weusthoff, Otto S., No. 212 East Third street, Dayton, O.
- Whall, Joseph S., No. 82 Hancock street, Quincy, Mass.
- Wharton, John C., No. 38 Union street, Nashville, Tenn.
- Wharton, William H., No. 38 Union street, Nashville, Tenn.
- Wheeler, C. Gilbert, No. 81 Clark street, Chicago, Ill.
- Wheeler, Leonard H., No. 78 State street, Albany, N. Y.
- Wheeler, Lucien F.*, Waldo, Fla.
- WHITE, AARON S., No. 59 High street, Mount Holly, N. J.
- White, George H., Newark and Jersey avenues, Jersey City, N. J.
- White, Philip A., No. 102 Gold street, New York, N. Y.
- WHITFIELD, THOMAS, No. 240 Wabash avenue, Chicago, Ill.
- Whiting, Frederick T., Main street, Great Barrington, Mass.
- Whitman, Nelson S., No. 3 Merchants' Exchange, Nashua, N. H.
- Whitney, Henry M., No. 29 Essex street, Lawrence, Mass.
- Wichelus, Frederick, No. 192 Greenwich street, New York, N. Y.
- Wickham, William H., No. 91 Fulton street, New York, N. Y.
- Wiegand, Thomas S., No. 4 South Thirty-eighth street, Philadelphia, Pa.
- Wienges, Conrad, No. 649 Jersey avenue, Jersey City, N. J.
- Wigert, Carl R., No. 213 Jefferson street, Burlington, Iowa.
- Wilcox, Frederick, Apothecaries' Hall, Exchange Place, Waterbury, Conn.
- Wiley, Goodwin R., Main street, Bethel, Me.
- Williams, Alfred N., No. 93 Market street, Parkersburg, W. Va.
- Williams, Doane B., No. 16 Lincoln Square, Worcester, Mass.
- Williams, John K., No. 391 Main street, Hartford, Conn.
- Williams, Richard W., Notre Dame street, Three Rivers, Quebec, Can.
- Williams, William H., No. 659 Main street, Wheeling, W. Va.
- Williamson, Edward J., Ninth and Franklin streets, St. Louis, Mo.
- Wilson, Albert H., Penn street and Franks-town avenue, Pittsburgh, Pa.
- Wilson, Benjamin O., No. 28 Merchants' Row, Boston, Mass.
- Wilson, Frank M., No. 133 Main street, Willimantic, Conn.
- Wilson, Julius H., No. 125 Twenty-second street, Chicago, Ill.
- Wilson, William, No. 106 Broadway, cor. Pine street, New York, N. Y.
- WINKLEMAN, JOHN H., Liberty and German streets, Baltimore, Md.
- Winslow, Edwin C., No. 107 Main street, Danville, Ill.
- Winslow, Samuel W., No. 131 Devonshire street, Boston, Mass.
- Winter, Jonas, No. 81 West Franklin street, Hagerstown, Md.
- Wiseman, Henry A., Main street, Danville, Va.
- Wohlfarth, Justin, No. 2002 Third avenue, New York, N. Y.
- Wolfe, Nathaniel, No. 213 Market street, Wilkesbarre, Pa.
- Wolff, Lawrence, No. 333 South Twelfth street, Philadelphia, Pa.
- Woltersdorf, Louis, No. 171 Blue Island avenue, Chicago, Ill.
- Wood, Edward S., No. 14 Chauncey street, Cambridge, Mass.
- Wood, Mason B., Taunton avenue and Valley street, East Providence, R. I.

- Woodbridge, George W.*, No. 160 State street, Boston, Mass.
- Woodruff, Roderick S.*, No. 91 Blank street, Waterbury, Conn.
- Woodward, Samuel M.*, No. 91 North Charles street, Baltimore, Md.
- Wooldridge, Napoleon*, Cedar Key, Fla.
- Worthington, J. Willits*, Main street, Moorestown, N. J.
- Wrampelmeier, Theodore J.*, San Diego, Cal.
- Wright, Archibald W.*, Front and Market streets, Philadelphia, Pa.
- Wright, Edward E.*, No. 24 Sycamore street, New Bedford, Mass.
- Wynn, William*, No. 496 Fulton street, Brooklyn, N. Y.
- Yatman, John L.*, Orange Valley, N. J.
- Yeakel, Nathan W.*, Nos. 107 and 109 Columbia street, Lafayette, Ind.
- Yorston, Matthew M.*, No. 429 Central avenue, Cincinnati, O.
- Young, Alexander T.*, No. 103 Sixteenth street, Wheeling, W. Va.
- Young, Judson J.*, No. 11 Freeman street, Kansas City, Mo.
- Young, William*, 114 Park avenue, Rich Hill, Mo.
- Zaegel, Max R.*, Eighth street, Sheboygan, Wis.
- Zahn, Emil A.*, No. 1801 State street, Chicago, Ill.
- Zeilin, John H.*, No. 306 Cherry street, Philadelphia, Pa.
- Zeller, William S.*, No. 14 Brinkerhoff Row, Bellefonte, Centre county, Pa.
- Zellhøfer, George*, No. 91 Fulton street, New York, N. Y.
- Ziegler, Philip M.*, No. 526 Penn street, Reading, Pa.
- Zimmerman, Charles*, No. 423 S. Adams street, Peoria, Ill.
- Zimmerman, John L.*, Arch and Ray streets, Searcy, Ark.
- Zoeller, Edward V.*, Main street, Tarboro, N. C.
- Zwick, George A.*, Eleventh street and Madison avenue, Covington, Ky.

LIST OF RESIGNATIONS.

Name,	Residence.	Elected.
§ Jas. A. Darlington,	Buffalo, N. Y.,	1882
§ Vincent Davis,	Louisville Ky.,	1874
† Jos. G. Feth,	Newport, Ky.,	1880
† Geo. Hodgetts,	Toronto, Ont., Can.,	1877
† Albert R. Griffith,	New York, N. Y.,	1870
§ William H. Griffith,	New York, N. Y.,	1874
§ Oscar L. Harries,	Buffalo, N. Y.,	1882
§ Charles K. Jones,	St. Louis, Mo.,	1867
§ Fred. C. Miller,	Louisville, Ky.,	1874
† Jas. H. Pearce,	Toronto, Ont., Can.,	1880
§ William Vincent,	Brooklyn, N. Y.,	1870

† Inability to attend the meetings.

§ No reason given.

LIST OF DECEASED MEMBERS.

Since the last meeting, notice of the death of the following members has been received :

		Elected.
William P. Campbell,	Cumberland, Md.,	1879
Dillwyn Parrish,	Philadelphia, Pa.,	1870
Samuel F. Troth,	Philadelphia, Pa.,	1857
Charles G. Underwood,	Boston, Mass.,	1865
Ransford W. Vandervoort	Newark, N. J.,	1870

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CORRECTION.

The formula for *dusting powder* on page 342, which had been incorrectly transcribed, should be as follows :

Dusting Powder of Sulphide of Zinc.—Hydrated sulphide of zinc, 1 p.; powdered steatite, 9 parts.

